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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

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CATERPILLAR®

CATERPILLAR®

SEBU6887-06
October 2001

Operation and Maintenance Manual

D6R Track-Type Tractor

4FM1-Up (Machine)
8TM1-Up (Machine)
9BM1-Up (Machine)
3ZN1-Up (Machine)
5LN1-Up (Machine)
7KN1-Up (Machine)
9MN1-Up (Machine)
9PN1-Up (Machine)
DMP1-Up (Machine)
4TR1-Up (Machine)
5PR1-Up (Machine)
5RR1-Up (Machine)
7DR1-Up (Machine)
7GR1-Up (Machine)
1RW1-Up (Machine)

Differential Steering

i01533183

Maintenance Interval Schedule

SMCS Code: 7000

Note: All safety information, warnings, and instructions must be read and understood before you perform any operation or any maintenance procedure.

Before each consecutive interval is performed, all of the maintenance requirements from the previous interval must also be performed.

When Required

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Battery, Battery Cable or Battery Disconnect Switch - Replace 82
Cab Air Filter - Clean/Replace 84
Circuit Breakers - Reset 85
Cutting Edges and End Bits - Inspect/Replace 89
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Engine Air Filter Secondary Element - Replace ... 92
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Window Wipers - Inspect/Replace 127

Daily

Fuel System - Fill 99

Every 10 Service Hours or Daily

Backup Alarm - Test 81
Brakes, Indicators and Gauges - Test 83
Cooling System Level - Check 88
Engine Oil Level - Check 94
Fuel Tank Water and Sediment - Drain 103
Hydraulic System Oil Level - Check 107
Seat Belt - Inspect 112
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Winch Oil Level - Check 125
Windows - Clean 127

Every 50 Service Hours or Weekly

Pivot Shaft Oil Level - Check 109
Ripper Linkage and Cylinder Bearings - Lubricate 111
Track Pins - Inspect 115

Initial 100 Service Hours

Trunnion Bearing - Adjust 121

Initial 250 Service Hours

Engine Valve Lash - Check 95
Transmission Oil Filter - Replace 118

Every 250 Service Hours or Monthly

Air Conditioner - Test 79
Air Conditioner Belt - Inspect/Adjust/Replace 79
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Angle Blade Manual Tilt Brace - Lubricate 81
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Engine Oil Sample - Obtain 94
Engine Oil and Filter - Change 95
Equalizer Bar Pins - Lubricate 96
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Track Adjustment - Adjust 113
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Initial 500 Service Hours

Transmission Oil Filter - Replace 118

Every 500 Service Hours

Differential and Final Drive Oil Sample - Obtain ... 90
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Every 500 Service Hours or 3 Months

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Lift Cylinder Yoke Bearings - Lubricate 109
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Transmission Magnetic Screen - Clean 117
Transmission Oil - Change 117
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Every 2000 Service Hours or 1 Year

Air Conditioner System - Check/Replace 80
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Engine Valve Rotators - Inspect 96
Final Drive Oil - Change 97
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Every 3000 Service Hours or 2 Years

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Cooling System Extended Life Coolant Extender - Add 87
Cooling System Water Temperature Regulator - Clean/Replace 89

Every 6000 Service Hours or 4 Years

Cooling System Extended Life Coolant - Change .. 87

Every 6000 Service Hours or 4 Years

Cooling System Extended Life Coolant - Change .. 87

i00074075

Air Conditioner - Test

SMCS Code: 7320-081

⚠ WARNING

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas can cause bodily harm or death.

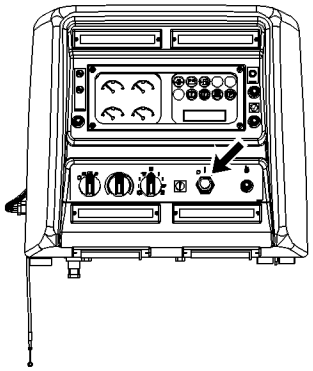


Illustration 139 g00104077

1. Start the engine. Operate the engine at HIGH IDLE.

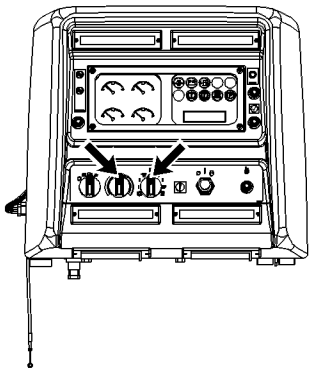


Illustration 140 g00104078

2. Set the air conditioner control for maximum cooling. Set the fan speed switch knob to the HIGH position.

3. To stabilize the air conditioning system, run the air conditioning system for two minutes.

4. Check for refrigerant in the system. Feel the suction line and the discharge line.

   If the system contains refrigerant, the discharge line is warmer than the suction line.

   If the system does not contain refrigerant or the system contains only a small amount of refrigerant, poor cooling will result.

5. Stop the engine.

i01321387

Air Conditioner Belt - Inspect/Adjust/Replace (If equipped)

SMCS Code: 1357-025; 1357-040; 1357-510

Inspect

1. Inspect the condition of the compressor drive belt. The belt should deflect 14 to 20 mm (.56 to .81 inch) under 110 N (25 lb) of force. Use a **144-0235** Belt Tension Gauge in order to measure the tension.

Adjust/Replace

1. Loosen compressor mounting bolts (1) and (2).

2. Loosen adjusting bracket nuts (3).

3. To achieve the correct belt tension, move the compressor inward or move the compressor outward. Tighten adjusting bracket nuts (3). Tighten compressor mounting bolts (1) and (2). Recheck the belt adjustment.

4. If necessary, repeat Step **1** to Step **3**.

Note: Use the same procedure in order to replace the belt.

i01363439

Air Conditioner System - Check/Replace

SMCS Code: 7320-510; 7320-535

⚠ WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, engine running or not. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well ventilated area.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel either away from the machine or where they can be seen.

Before you do a performance check of the air conditioning system, check the following items:

1. Check the condenser.

   a. Check for any type of restriction that will obstruct the air flow. Check for dirt, insects, plastic bags, etc.

   b. With condensers that are mounted on the roof, always check that both the fan motors are running. Check for restrictions. A clean condenser will lead to longer life for the compressor.

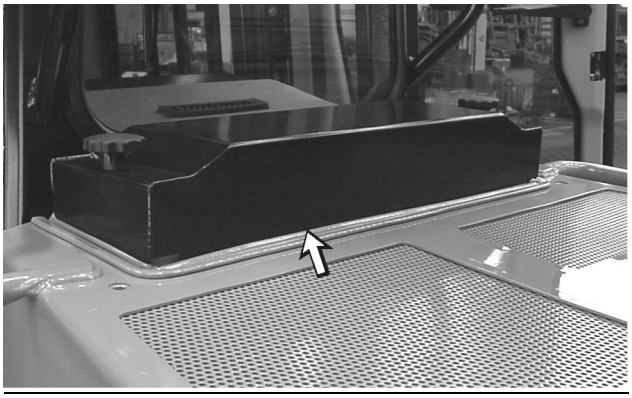


Illustration 141 g00737294

2. Clean the fresh air filters.

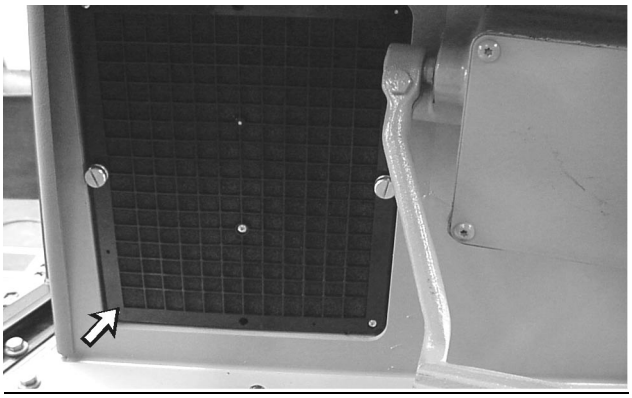


Illustration 142 g00737301

3. Clean the recirculation filters.

4. Replace the in-line dryer annually.

   Reference: Refer to the topics of Service Manual, SENR5664, “Receiver (Refrigerant Dryer) Remove and Install” and of Service Manual, SENR5664, “In-Line Refrigerant Dryer- Remove and Install” in the Service Manual for your machine.

i00072461

Alternator and Fan Belts - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510

1. Open the access door on the right side of the machine.

Note: Even if only one belt is worn or damaged, replace the belts in sets.

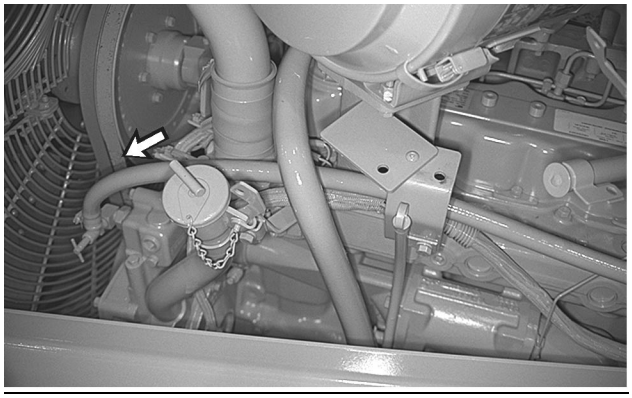


Illustration 143 g00103677

2. Inspect the condition of the fan and of the alternator belt. The belts should deflect 9 to 15 mm (.38 to .62 inch) under 110 N (25 lb) of force.

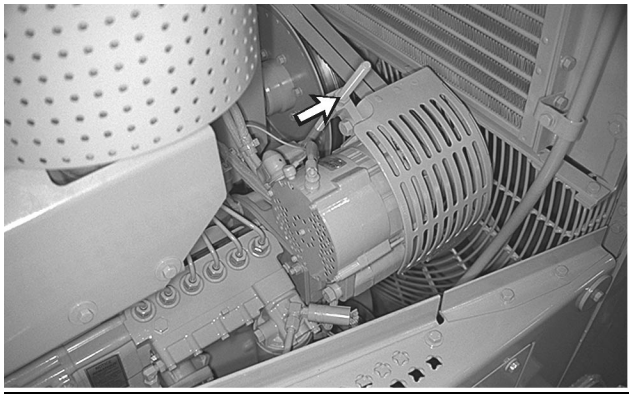


Illustration 144 g00103678

3. Loosen the adjusting locknut.

4. Turn the adjusting nut until the correct belt tension is reached. To achieve the correct belt adjustment, move the alternator inward or move the alternator outward, as required.

5. Tighten the adjusting locknut.

6. If new belts are installed, check the belt adjustment again after 30 minutes of engine operation.

7. Close the access door.

i01034553

Angle Blade Manual Tilt Brace - Lubricate

SMCS Code: 6074-086

If equipped:

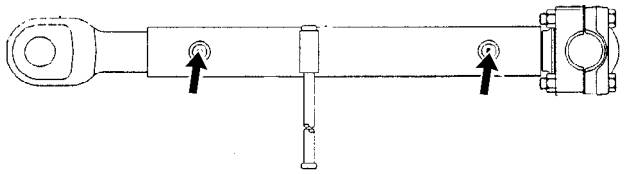


Illustration 145 g00103702

Lubricate the two fittings. Use Multipurpose Lithium Complex Grease with Molybdenum (MPGM).

i01309186

Backup Alarm - Test

SMCS Code: 7406-081

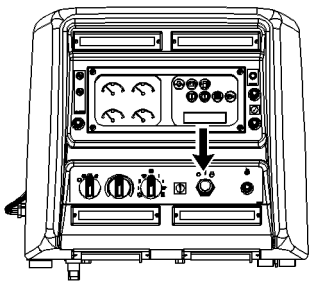


Illustration 146 g00103574

Turn the engine start switch to the ON position in order to perform the test.

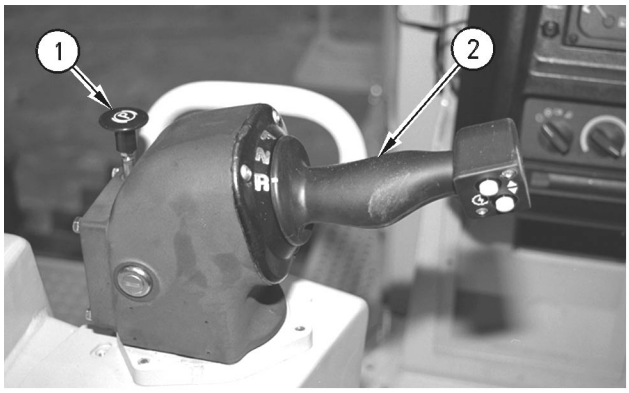


Illustration 147 g00339521

Apply the service brakes. Disengage parking brake switch (1). Move transmission direction selector (2) to the REVERSE position.

The backup alarm should sound immediately. The backup alarm should continue to sound until the transmission direction selector is moved to the NEUTRAL position or to the FORWARD position.

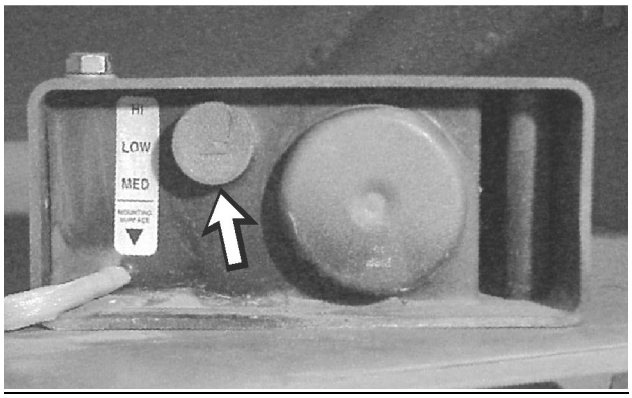


Illustration 148 g00637537
The toggle switch is located under the protective cap.

The backup alarm is on the rear, right side of the machine.

To adjust the sound level, move the toggle switch that is on the rear of the backup alarm. The backup alarm is set at the highest sound level when the machine is shipped from the factory. The adjustment knob should remain at the HIGH position unless the job site requires a lower sound level.

i00998344

Battery - Inspect

SMCS Code: 1401-040

Tighten the battery retainers on all batteries at every 1000 hour interval.

Perform the following procedures at every 1000 hour interval. Check the following areas more often, as required:

- Clean the top of the batteries with a clean cloth.
- Keep the terminals clean and coat the terminals with petroleum jelly.
- Keep the terminal covers in place.

1. Open the battery access cover.
2. Clean the top of the batteries with a clean cloth. Keep the terminals clean and coated with petroleum jelly. Install the terminal covers after you coat the terminals.
3. Close the battery access cover.

i00058390

Battery - Recycle

SMCS Code: 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i00760485

Battery, Battery Cable or Battery Disconnect Switch - Replace

SMCS Code: 1401-510; 1402-510; 1411-510

1. Turn the engine start switch key to the OFF position. Turn all of the switches to the OFF position.
2. Turn the battery disconnect switch to the OFF position. Remove the key.
3. Disconnect the battery cable at the battery disconnect switch. The battery disconnect switch is connected to the machine frame.
4. Disconnect the negative battery cable at the battery.
5. Make necessary repairs or replace the battery.

6. Connect the negative battery cable at the battery.

7. Connect the battery cable at the battery disconnect switch.

8. Install the key and turn the battery disconnect switch to the ON position.

i00074117

Brakes, Indicators and Gauges - Test

SMCS Code: 4100-081; 7000-081; 7450-081

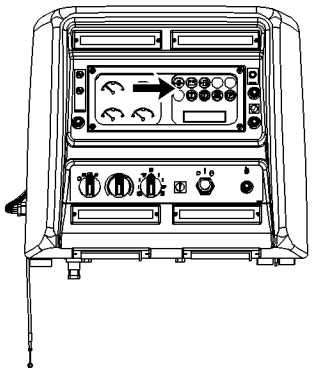


Illustration 149 g00104090

Check the operation of the Caterpillar Monitoring System. Observe the self-test when you start the engine.

The system performs an automatic self-test when you turn the engine start switch to the ON position.

The self-test verifies that the monitoring panel and the display modules are operating properly.

The internal circuits, the indicators, and the gauges are automatically checked.

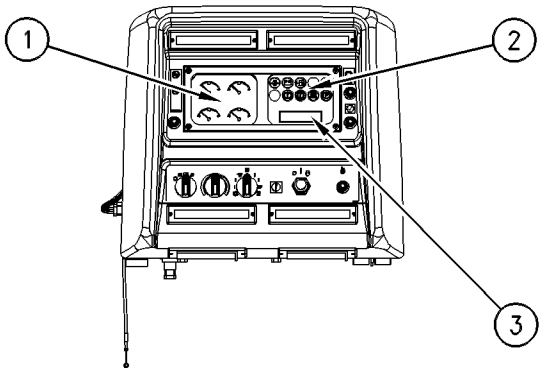


Illustration 150 g00104091

The operator must observe the indicators and the gauges in order to determine whether module (1), module (2), module (3), the indicators, and the gauges are operating properly. The self-test lasts for approximately three seconds.

During the self-test, all alert indicators flash.

The digital display shows the following readouts:

- All indicators of units (Deg C, kPa, miles, km, rpm, and liters)
- “X10” readout
- Symbol for the hour meter
- “8.8.8.X.8.8” readout

The pointers in the gauges point upward. Then, the pointers point to the left. Then, the pointers point to the right. Then, the pointers point to the final positions.

- The gear/direction readout shows “* *”.
- The action light stays illuminated.
- The action alarm sounds once.

The monitoring panel is then in the normal operating mode.

If the above tests are not correctly completed, the system will not function in the normal operating mode. Consult your Caterpillar dealer for an electrical system check. Any repairs must be made before you start the engine.

Turn on all of the machine lights. Check for proper operation. Sound the forward horn.

Move the machine forward and test the service brakes. See Operation and Maintenance Manual, “Braking System - Test”.

Stop the engine.

Make any necessary repairs before you operate the machine.

i00074166

Braking System - Test

SMCS Code: 4100-081; 4267-081

⚠ WARNING

If the machine moves during the test, reduce the engine speed immediately, and engage the parking brake.

If the machine moved while testing the brakes, consult your Caterpillar dealer for brake inspection and repair. Damaged brakes must be repaired before returning the machine to operation.

Make sure that the area around the machine is clear of personnel and clear of obstacles.

Test the brakes on a dry, level surface.

Fasten the seat belt before you test the brakes.

The following test is used to determine whether the service brake is functional. This test is not intended to determine the maximum brake holding effort. The brake holding effort of this machine will be different than the brake holding effort of other machines because of variations in the engine setting, in the power train efficiency, and in the brake holding ability.

Compare the engine speed at the beginning of machine movement to the engine speed of a prior test. This will be an indication of the amount of system deterioration.

1. Start the engine.
2. Raise all implements.
3. Depress the brake pedal.
4. Select the mode of manual shift.
5. Release the parking brake.
6. While the brake pedal is depressed, move the directional control to the NEUTRAL position.
7. Select the THIRD SPEED position. The control panel will indicate “3N”.
8. Select the FORWARD position. The control panel will indicate “3F”.
9. Gradually increase the engine speed to full load speed. The machine should not move.
10. Move the directional control to the NEUTRAL position.
11. Move the governor control lever to LOW IDLE. Engage the parking brake. Lower all implements to the ground. Apply a slight down pressure. Stop the engine.

NOTICE

If the machine moved while testing the brakes, contact your Caterpillar dealer. Have the dealer inspect and, if necessary, repair the service brake before returning the machine to operation.

i01248965

Bulldozer - Lubricate (Power Angle Tilt Blade)

SMCS Code: 6050-086

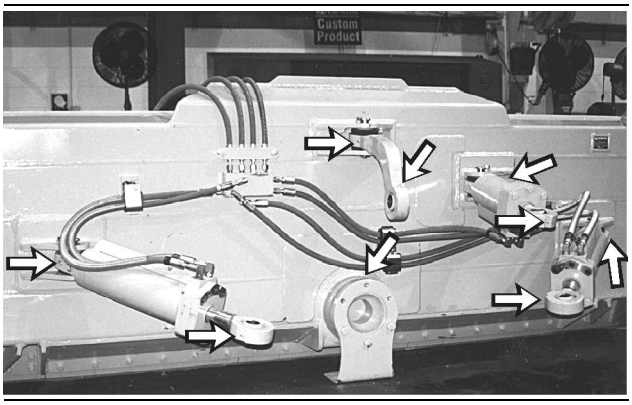


Illustration 151 g00665856

The Power Angle Tilt Blade is shown separately for photographic purposes.

Lubricate the Power Angle Tilt Blade at every 250 hour interval.

1. Lubricate the bearings on the ends of each hydraulic cylinder (6 points).
2. Lubricate the bearings on each end of the stabilizer link (2 points).
3. Lubricate the trunnion bearing (1 point).

i00072752

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070-FI; 7342-510-FI

Clean Filters

Note: Clean the filters more often in dusty conditions.

Illustration 152 g00103708

1. Remove the filter cover and the filter elements. The filter cover is in front of the cab.

2. Remove the filter elements that are positioned in the operator's compartment. Clean the filter elements with pressure air or wash the elements in warm water and in a nonsudsing household detergent.

3. Rinse the filter elements in clean water and air dry the elements thoroughly.

4. Install the filter elements. Install the filter cover.

i00753322

Circuit Breakers - Reset

SMCS Code: 1417-529; 1420-529

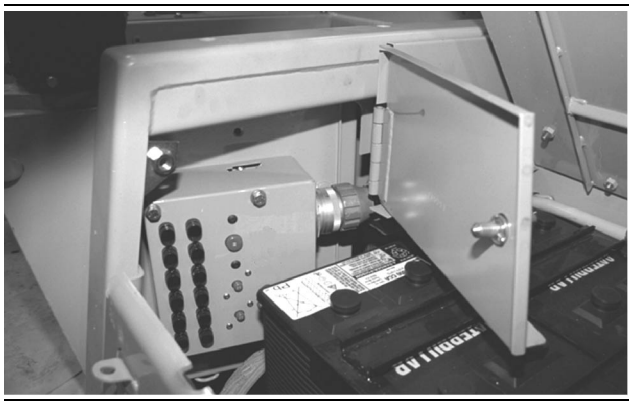


Illustration 153 g00339673

The fuse panel is in the battery compartment on the left side of the machine.

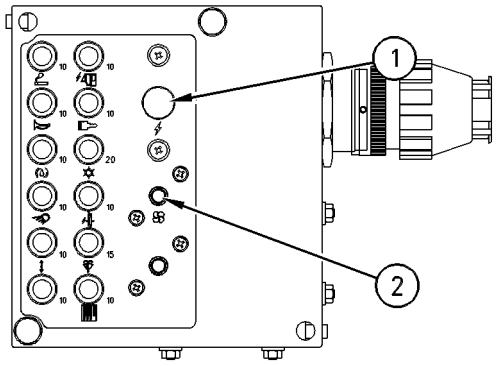


Illustration 154 g00103722

Circuit Breaker/Reset – Push in the button in order to reset the circuit breaker. If the electrical system is working properly, the button will remain depressed. If the button does not remain depressed, check the appropriate electrical circuit. Repair the electrical circuit, if necessary.

(1) Alternator – 80 Amp

(2) Heater and Air Blower Motor Reset – 20 Amp

i00072729

Cooling System Additive (DEAC) - Add

SMCS Code: 1352-510

See the appropriate topics in your machine's Operation and Maintenance Manual for all cooling system requirements.

Use 8T-5296 Test Group to check the concentration of the coolant.

If necessary, add supplemental coolant additive.

NOTICE
Do not exceed the recommended six percent supplemental coolant additive concentration. Excessive supplemental coolant additive concentration can form deposits on the higher temperature surfaces of the cooling system, reducing the engine's heat heat transfer characteristics. Reduced heat transfer could cause cracking of the cylinder head and other high temperature components. Excessive supplemental coolant additive concentration could also result in radiator tube blockage, overheating, and/or accelerated water pump seal wear. Never use both liquid supplemental coolant additive and the spin-on element (if equipped) at the same time. The use of those additives together could result in supplemental coolant additive concentration exceeding the recommended six percent maximum.

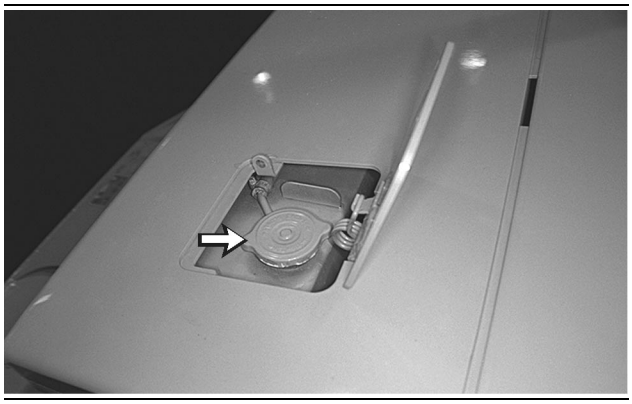


Illustration 155 g00102263

1. Slowly loosen the filler cap in order to relieve the pressure. Remove the cap.

2. Add supplemental coolant additive. Drain some coolant from the radiator into a suitable container in order to allow space for the extra coolant additive.

Note: Always discard drained fluids according to local regulations.

3. Add 0.24 L (.50 pint) of supplemental coolant additive for every 38 L (10 US gal) of engine cooling capacity.

4. Inspect the filler cap gasket. Replace the filler cap if the gasket is damaged.

5. Install the filler cap.

i00760772

Cooling System Coolant (DEAC) - Change

SMCS Code: 1352-044; 1395-044

NOTICE
Make sure you read and understand the information in the topics Safety and Cooling System Specifications for all information pertaining to water, antifreeze and supplemental coolant additive requirements before you proceed with maintenance of the cooling system.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide", for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Drain the coolant whenever the coolant is dirty or whenever foaming is observed.

The radiator cap is positioned in the top of the hood.

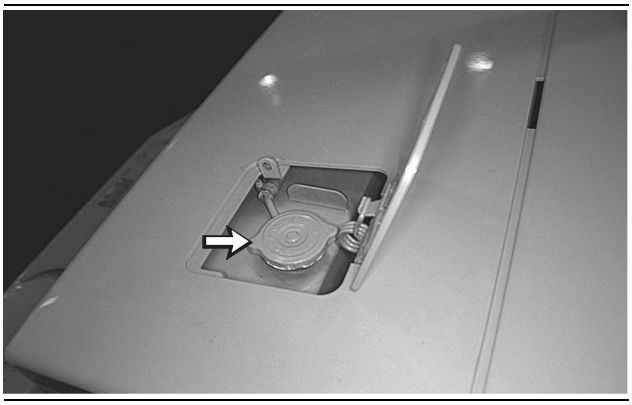


Illustration 156 g00101147

1. Slowly loosen the radiator cap in order to relieve system pressure. Remove the radiator cap.

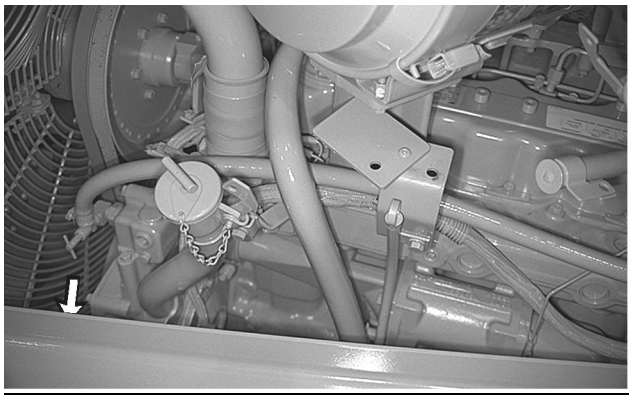


Illustration 157 g00103703

2. The drain valve is under the radiator. Open the drain valve. Allow the coolant to drain into a suitable container.

3. Close the drain valve. Fill the system with a solution which consists of clean water and of cooling system cleaner. The concentration of the cooling system cleaner should be 6 to 10 percent.

4. Start the engine. Run the engine for 90 minutes. Stop the engine. Drain the cleaning solution into a suitable container.

5. While the engine is stopped, flush the system with water. Flush the system until the draining water is clear.

6. Close the drain valve.

7. Add the coolant solution. See the following topics:

- Operation and Maintenance Manual, “Cooling System Specifications”
- Operation and Maintenance Manual, “Lubricant Viscosities”
- Operation and Maintenance Manual, “Refill Capacities”

Note: If you are using Caterpillar antifreeze, do not add the supplemental coolant additive at this time. Also, do not change the supplemental coolant additive element at this time.

8. Start the engine. Run the engine without the radiator cap until the thermostat opens and the coolant level stabilizes.

9. Maintain the coolant level within 13 mm (.5 inches) of the bottom of the filler pipe.

10. If the gasket is damaged, replace the radiator cap. Install the radiator cap.

11. Stop the engine.

i00060003

Cooling System Extended Life Coolant - Change

SMCS Code: 1350-044; 1395-044

For information about adding an extender to your cooling system, see Operation and Maintenance Manual, “Cooling System Extended Life Coolant Extender - Add” or consult your Caterpillar dealer.

Flushing the ELC from the Cooling System

Some engines utilize Extended Life Coolant (ELC). See the Operation and Maintenance Manual, “Maintenance Interval Schedule” for the proper service interval. If an ELC was previously used, flush the cooling system with clean water. No other cleaning agents are required.

Flushing a Standard Coolant from the Cooling System

If you change to an ELC from another type of coolant, use a Caterpillar cleaning agent to flush the cooling system. After you drain the cooling system, thoroughly flush the cooling system with clean water. **All of the cleaning agent must be removed from the cooling system.**

Note: See the Operation and Maintenance Manual, “Cooling System Coolant - Change” for the draining procedure and for the flushing procedure.

i00743002

Cooling System Extended Life Coolant Extender - Add

SMCS Code: 1350; 1352-544-NL; 1395-544-NL

When a Caterpillar Extended Life Coolant (ELC) is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, “Maintenance Interval Schedule” for the proper service interval. The amount of extender is determined by the cooling system capacity.

Table 20

RECOMMENDED AMOUNT OF EXTENDER BY COOLING SYSTEM CAPACITY	
Cooling System Capacity	**Recommended Amount of Extender**
22 to 30 L (6 to 8 US gal)	0.57 L (.60 qt)
30 to 38 L (8 to 10 US gal)	0.71 L (.75 qt)
38 to 49 L (10 to 13 US gal)	0.95 L (1 qt)
49 to 64 L (13 to 17 US gal)	1.18 L (1.25 qt)

Refer to Operation and Maintenance Manual, “Refill Capacities” for the cooling system capacity.

For additional information about adding an extender, see Operation and Maintenance Manual, “Coolant Recommendations” or consult your Caterpillar dealer.

i00072607

Cooling System Level - Check

SMCS Code: 1353-535-FLV; 1395-535-FLV

⚠ WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

This machine’s radiator has a surge tank. There is no top tank in this cooling system. The surge tank has a filler cap and a sight glass. It is not necessary to remove the filler cap in order to check the coolant level. The sight glass is inside the engine compartment that is on the front left side of the machine. The filler cap is beneath the access door that is on the top left side of the radiator guard.

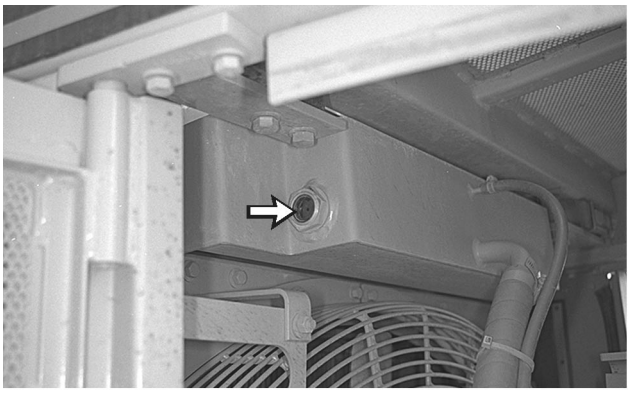


Illustration 158 g00103926

1. Observe the sight glass in order to verify the level of the coolant. If the coolant completely covers the sight glass, the coolant level is okay. If the coolant level is visible in the sight glass, the coolant is low.

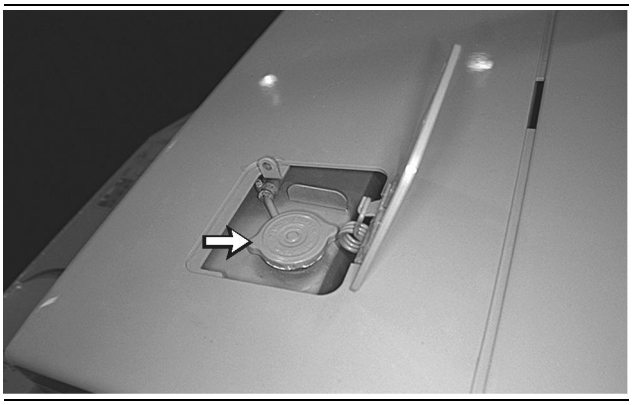


Illustration 159 g00101147

2. If it is necessary to add coolant, remove the radiator cap slowly in order to relieve the pressure.

3. Fill the cooling system to the bottom of the filler tube. Adding coolant above the bottom of the filler tube will cause the coolant to overflow the cooling system.

4. Maintain the coolant level between the top of the sight glass and the bottom of the filler tube. If you need to add coolant daily, check the cooling system for leaks.

5. Inspect the radiator cap and the radiator cap seal for debris, for foreign material, or for damage. Clean the radiator cap with a clean cloth. Replace the radiator cap if the radiator cap is damaged.

6. Install the radiator cap.

7. Inspect the radiator core for debris. Clean the radiator core, if necessary.

Use compressed air, high pressure water, or steam to remove dust and debris from the radiator core. However, the use of compressed air is preferred.

i01000516

Cooling System Water Temperature Regulator - Clean/Replace

SMCS Code: 1355-070; 1355-510; 1393

Replace the thermostat on a regular basis in order to reduce the chance of unscheduled downtime and of problems with the cooling system.

A new thermostat should be installed after the cooling system has been cleaned. Install the thermostat while the cooling system is completely drained or while the cooling system coolant is drained to a level that is below the thermostat housing.

NOTICE
Failure to replace the engine's thermostat on a regularly scheduled basis could cause severe engine damage.

Note: If you are only installing a new thermostat, drain the cooling system coolant to a level that is below the thermostat housing.

1. Loosen the hose clamp and remove the hose from the elbow. Disconnect the hose assembly from the thermostat housing assembly.

2. Remove the bolts from the elbow. Remove the elbow and the thermostat housing assembly.

3. Remove the gasket, the thermostat, and the seal from the thermostat housing.

NOTICE
A used thermostat can be installed if the thermostat conforms to test specifications, and the thermostat is not damaged. Do not install a used thermostat that has excessive buildup or deposits.

NOTICE
Since Caterpillar engines incorporate a shunt design cooling system, it is mandatory to always operate the engine with a thermostat.

Depending on load, failure to operate with a thermostat could result in either an overheating or an overcooling condition.

NOTICE
If the thermostat is installed incorrectly, it will cause the engine to overheat.

4. Install a new seal in the thermostat housing. Install a new thermostat and a new gasket. Install the thermostat housing on the engine cylinder head.

5. Install the elbow and the hose. Tighten the hose clamp.

i00072674

Cutting Edges and End Bits - Inspect/Replace

SMCS Code: 6801-040; 6801-510; 6804-040; 6804-510

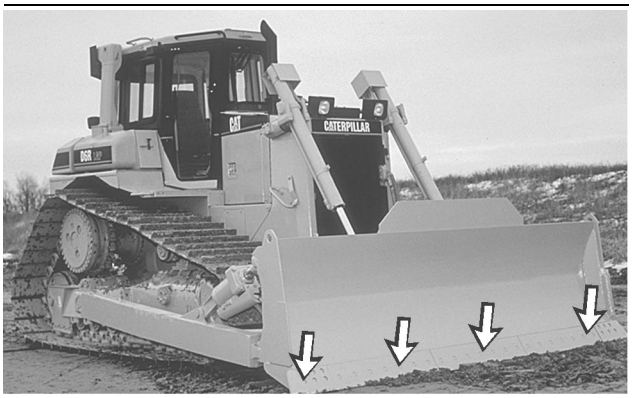


Illustration 160 g00103694

1. Raise the bulldozer blade and block up the bulldozer blade. When you remove the cutting edges and the end bits, maintain the bulldozer blade at a minimum height.

2. Remove the bolts. Then remove the cutting edge and the end bits.

3. Thoroughly clean all contact surfaces.

4. Inspect the opposite side of the cutting edge. If the opposite side of the cutting edge is not worn, turn the opposite side of the cutting edge outward and install the cutting edge.

5. If both sides of the cutting edge are worn, install a new cutting edge section.

6. Repeat Step 4 and Step 5 for the end bits.

7. Install all bolts and tighten the bolts to the specified torque. Refer to Operation and Maintenance Manual, “Torques for Ground Engaging Tools”.

8. Raise the bulldozer blade and remove the blocking. Lower the bulldozer blade to the ground.

9. After you operate the machine for a few hours, check all bolts for the proper torque.

i01096912

Differential and Final Drive Oil Sample - Obtain

SMCS Code: 3258-008; 4050-008; 7542-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of final drive oil as close as possible to the recommended sampling interval. The recommended sampling interval is every 500 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

If the machine is operated under a high load and/or under high temperature conditions, sample all fluids at the 250 hour interval.

Do not use the drain stream method to obtain a sample of the final drive oil. A stream of dirty oil from the bottom of the compartment will contaminate the sample. Likewise, never dip an oil sample from an oil container or pour a sample from a used filter.

Two preferred methods are available for obtaining this sample:

- Use an in-line sampling valve for pressurized oil systems.
- Use a sampling gun that is inserted into the sump.

Reference: Refer to , “S·O·S Oil Analysis” in the Maintenance Section of this manual for more information about these sampling methods.

Reference: Refer to , “Lubricant Viscosities” in the Maintenance Section of this manual for the correct fluid for your machine.

i00748057

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1051-070; 1051-510-PY; 1054-070-PY; 1054-510-PY

Illustration 161 g00336425

1. Open the access door (if equipped). The access door is located on the left side of the machine outside the operator's compartment.

Illustration 162 g00103726

2. Remove the air cleaner cover.

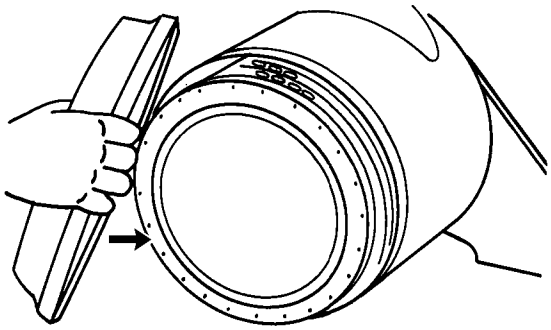


Illustration 163 g00100510

3. Remove the primary filter element from the air cleaner housing.

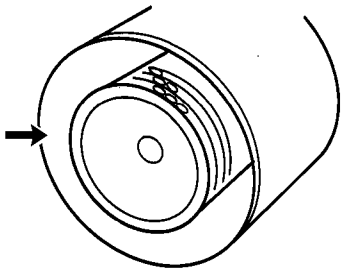


Illustration 164 g00039201

4. Clean the inside of the air cleaner housing.

5. Inspect the primary element. If the pleats, the gaskets, or the seals are damaged, discard the element. Replace a damaged primary element with a clean primary element.

NOTICE

Do not clean the filter elements by bumping or tapping them. Do not use filter elements with damaged pleats, gaskets or seals. Engine damage can result.

Make sure the cleaned filter elements are completely dry before installing into the filter housing. Water remaining in the elements can cause false indications of contamination in Scheduled Oil Sampling test results.

6. If the primary element is not damaged, clean the primary element.

The filter elements can be cleaned by using the following methods:

- Pressure air
- Pressure water
- Detergent washing

When you use pressure air, the maximum air pressure is 205 kPa (30 psi). When you use pressure water, the maximum water pressure is 280 kPa (40 psi).

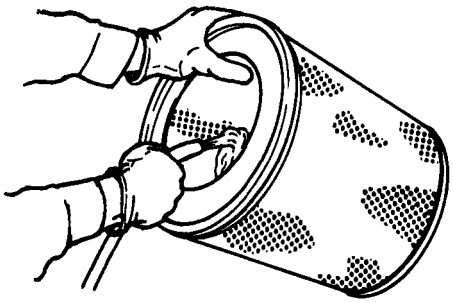


Illustration 165 g00039203

7. When you clean the inside pleats and the outside pleats, direct the air along the pleats or direct the water along the pleats.

The element can be washed in a solution that consists of warm water and of nonsudsing household detergent. Fully rinse the pleats. Allow the filter to air dry completely.

8. Inspect the filter elements after you clean the filter elements. Do not use a filter if the pleats, the gaskets or the seals are damaged.

9. Cover the clean filter elements. Store the elements in a clean, dry location.

A primary element may be cleaned for a maximum of six times. Also replace the primary element if the primary element has been used for one year.

10. Install a clean primary filter element.

11. Clean the cover and install the cover.

12. Close the access door (if equipped).

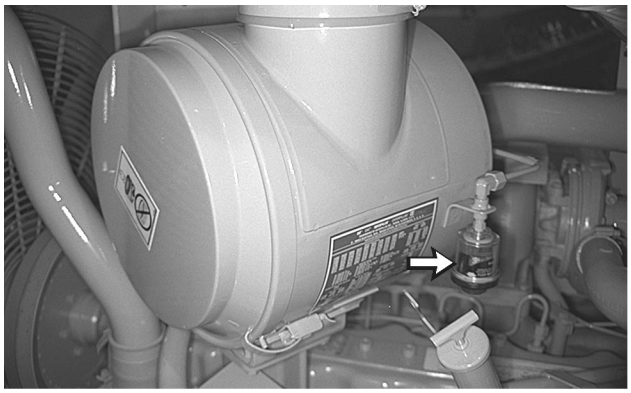


Illustration 166 g00103729

13. Reset the filter element indicator.

Start the engine. If the yellow piston in the filter element indicator moves into the red zone, install a new primary filter element. Also if the exhaust smoke is black, install a new primary filter element.

i00072807

Engine Air Filter Secondary Element - Replace

SMCS Code: 1051-510-SE; 1054-510-SE

NOTICE
Always replace the secondary element. Do not attempt to reuse it by cleaning. Engine damage could result.

Note: Replace the secondary filter element when you service the primary element for the third time. If a clean primary element has been installed and the filter element indicator still enters the red zone, replace the secondary filter element. Also if the exhaust smoke remains black and a clean primary filter element has been installed, replace the secondary filter element.

Illustration 167 g00103734

1. Open the access cover (if equipped).

2. Remove the housing cover and the primary element.

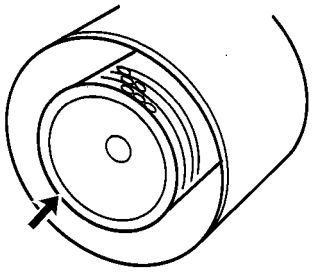


Illustration 168 g00039214

3. Remove the secondary element.

4. Cover the air inlet opening. Clean the inside of the air cleaner housing.

5. Inspect the gasket between the air inlet and the housing. If the gasket is damaged, replace the gasket.

6. Uncover the air inlet opening. Install a new secondary element.

7. Install the primary element and the air cleaner housing cover.

8. Close the access cover (if equipped).

i00072811

Engine Air Precleaner - Clean

SMCS Code: 1050-070

Illustration 169 g00103735

1. Inspect the air inlet screen for dirt and for trash.
2. Remove the screen. Clean the screen if the screen is dirty.
3. Inspect the precleaner tube for dirt and for dust.
4. Clean the precleaner tube with pressure air if the precleaner tube is dirty.

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

Run the engine at high idle. If the yellow piston in the filter element indicator enters the red zone, service the air cleaner. Stop the engine.

i00072815

Engine Crankcase Breather - Clean

SMCS Code: 1317-070

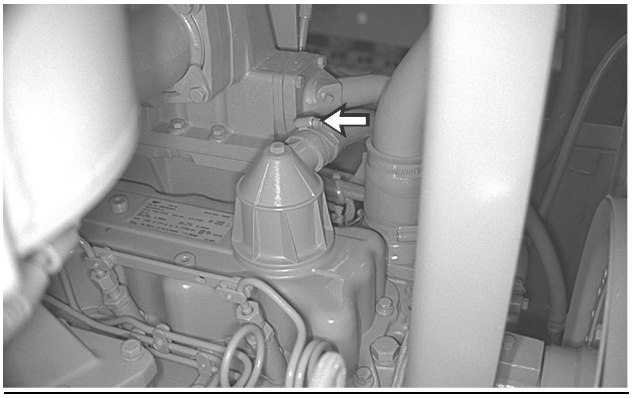


Illustration 170 g00103737

1. Loosen the breather outlet hose clamps. Remove the hose from the breather cover.
2. Loosen the breather inlet hose clamp. Remove the engine crankcase breather.
3. Check the condition of the cover seal. Replace the cover seal if the cover seal is damaged.
4. Wash the breather element and the breather element cover assembly in a clean nonflammable solvent.
5. Shake the breather element until the breather element is dry. You may also use pressure air to dry the breather element.
6. Check the condition of the hose. Replace the hose if the hose is damaged.
7. Install the breather element cover assembly.
8. Install the hose and the breather outlet hose clamps.
9. Install the access cover.

i01365509

Engine Oil Level - Check

SMCS Code: 1302-535-FLV; 1326-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE
Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

1. The level gauge relies on gravity. The machine must be on a level surface for an accurate check.

2. Open the access cover that is on the left side of the machine.

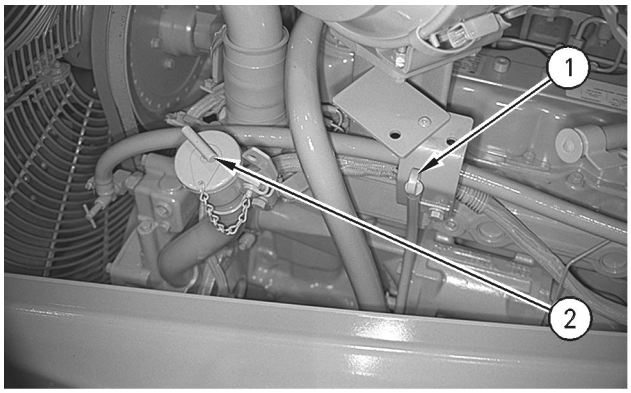


Illustration 171 g00103739

3. Check the “SAFE OPERATING RANGE” side of the dipstick (1) while the engine is running and the oil is at operating temperature. Maintain the oil level in the crosshatch on the dipstick.

   Check the “SAFE STARTING RANGE” side of dipstick (1) while the engine is stopped. The oil should be cold. Maintain the oil level in the crosshatch on the dipstick.

Note: When you operate the machine on severe slopes, the oil level in the engine crankcase must be at the top end of the “SAFE STARTING RANGE” side of the dipstick.

4. Remove oil filler cap (2). If necessary, add oil.

5. Clean the oil filler cap and install the oil filler cap.

6. Close the access cover.

i00709687

Engine Oil Sample - Obtain

SMCS Code: 1000-008; 7542-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide”, for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the engine oil as close as possible to the recommended sampling interval. The recommended sampling interval is every 250 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

1. Open the access cover on the left side of the machine.

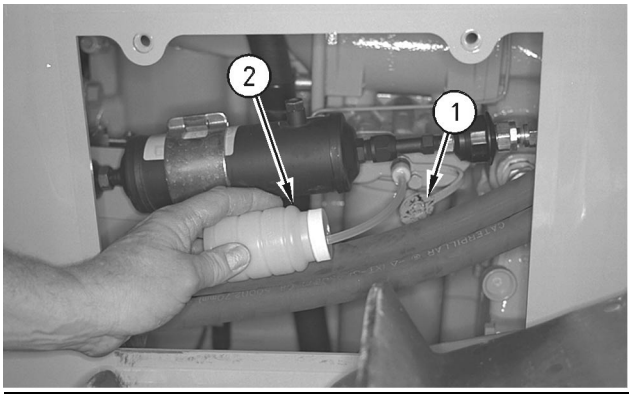


Illustration 172 g00318543

The sampling valve for the engine oil is shown.

2. Remove the protective cap (1).

3. Use 8T-9190 Fluid Sampling Bottle Group (2) in order to obtain a sample.

4. Replace the protective cap.

5. Install the access cover.

Refer to Operation and Maintenance Manual, “Lubricant Viscosities” for the correct fluid for your machine.

i00072867

Engine Oil and Filter - Change

SMCS Code: 1308; 1318-510

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

1. Remove the crankcase drain access cover, which is in the crankcase guard.

2. Remove the crankcase drain plug. Allow the oil to drain into a suitable container.

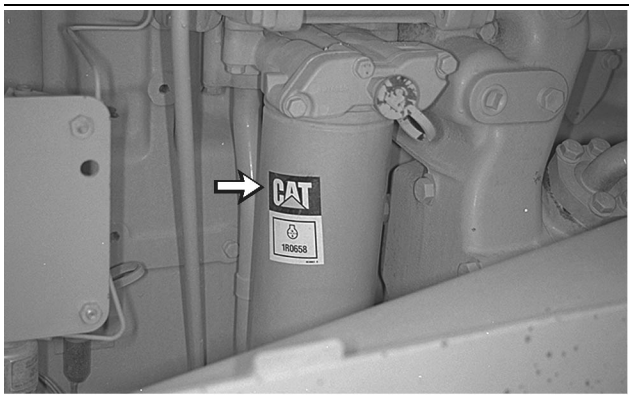


Illustration 173 g00103750

3. Remove the engine oil filter element and discard the engine oil filter element properly. Make sure that all of the old filter seal is removed from the filter base.

4. Apply a thin coat of oil to the new filter seals. Install the new engine oil filter elements by hand. When the gaskets contact the filter base, tighten the filter elements by an additional turn of 270 degrees. Rotation index marks are on the new filter elements. These rotation index marks are spaced at 90 degree intervals. Use these rotation index marks as a guide for proper tightening.

5. Install the crankcase drain plug.

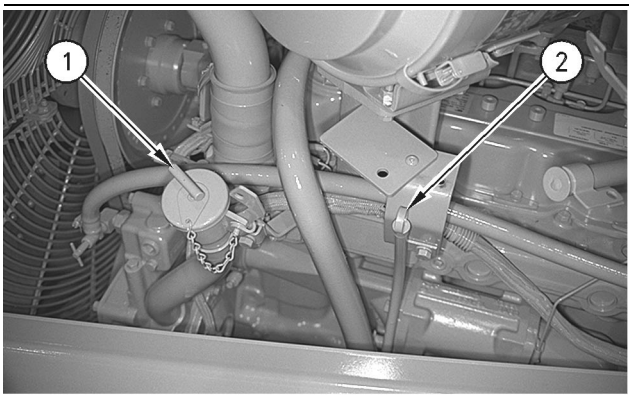


Illustration 174 g00103751

6. Remove the oil filler cap (1). Fill the crankcase with new oil. See Operation and Maintenance Manual, “Refill Capacities”. Clean the oil filler cap and install the oil filler cap.

7. Always measure the oil level with dipstick (2) in order to ensure that the correct amount of oil was added.

8. On the dipstick, maintain the oil level between the “ADD”mark and “FULL” mark.

i00072748

Engine Valve Lash - Check

SMCS Code: 1102; 1209-535

In order to perform the procedure for the valve lash check and for the engine valve lash adjustment, refer to the Service Manual, SENR2380, “3304B & 3306B Diesel Engines ”.

Note: Make sure that qualified service personnel check the injector fuel timing. If an adjustment is necessary, make sure that qualified service personnel adjust the injector fuel timing. Special tools and training are required.

Note: The correct fuel timing specification is shown on the Engine Information Plate. Fuel timing specifications will be different with each engine application and with each power rating.

Consult your Caterpillar dealer for the complete adjustment procedure.

i01394331

Engine Valve Rotators - Inspect

SMCS Code: 1109-040

Caterpillar recommends replacing valve rotators that are operating improperly. An improperly operating valve rotator will shorten valve life because of accelerated wear on the valves. Also, metal particles from a damaged valve rotator could fall into the cylinder and damage to the piston head and to the cylinder head may result.

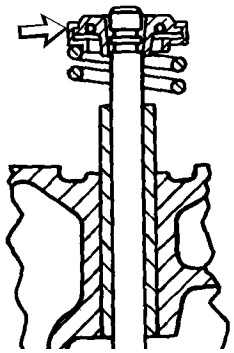


Illustration 175 g00038585

Start the engine and run the engine at low idle. Watch the top surface of each valve rotator. Whenever an inlet valve closes or an exhaust valve closes, each valve rotator should turn.

If a valve rotator fails to turn, consult your Caterpillar dealer for service.

i00072763

Equalizer Bar Pins - Inspect

SMCS Code: 7206-040-PN; 7207-040-PN

Illustration 176 g00103710

Check the equalizer bar pins for looseness and for unusual wear.

If unusual wear is evident, see the Service Manual or consult your Caterpillar dealer for an inspection and for repair instructions.

i00753601

Equalizer Bar Pins - Lubricate

SMCS Code: 7206-086-PN; 7207-086-PN

NOTICE
Apply lubricant to the fittings with a hand operated grease gun only. Use of pressure operated lubricating equipment damages the seals.

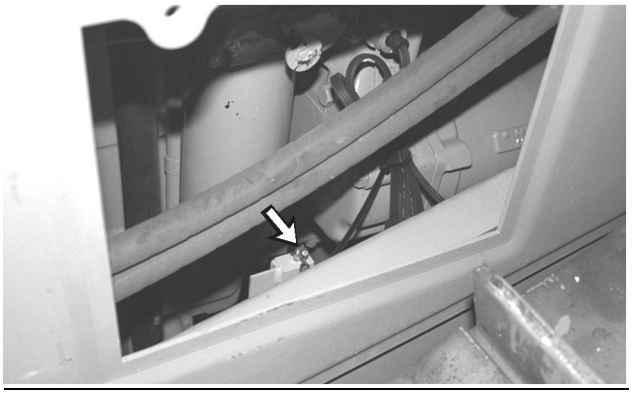


Illustration 177 g00340074
Remote Fitting

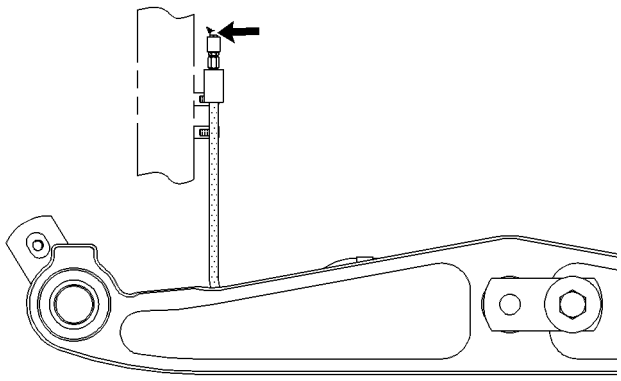


Illustration 178 g00103719

Lubricate the equalizer bar center pin through the remote fitting. The remote fitting is located on the frame on the left side of the machine. The fitting is located below the dipstick.

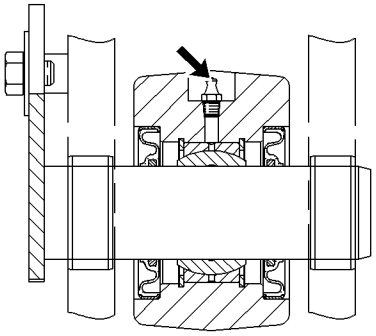


Illustration 179 g00103720

There are two additional end fittings that are located at each end of the equalizer bar. Lubricate the equalizer bar end pins through the two end fittings.

i00072788

Ether Starting Aid Cylinder - Replace

SMCS Code: 1456-510-CD

Illustration 180 g00103728

1. Open the left engine access door. The ether starting aid is located on the left front of the engine.
2. Loosen the cylinder retaining clamp. Unscrew the empty ether starting aid cylinder and remove the empty ether starting aid cylinder.
3. Remove the used gasket. Install the new gasket that is provided with each new ether starting aid cylinder.
4. Install the new ether starting aid cylinder. Tighten the ether starting aid cylinder by hand. Tighten the cylinder retaining clamp securely.
5. Close the engine access door.

i01262397

Fan Drive Pulley and Idler - Lubricate

SMCS Code: 1359-086

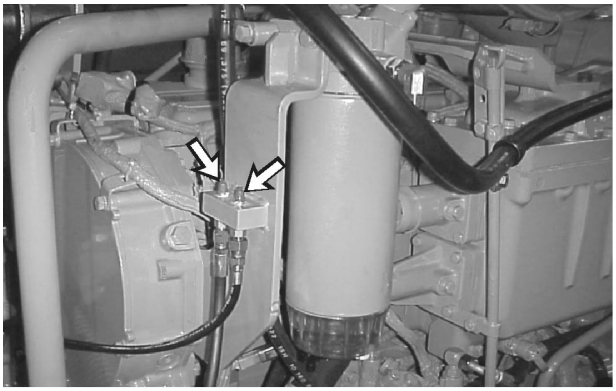


Illustration 181 g00671267

Lubricate two fittings with Bearing Lubricant Special Purpose Grease (SPG). The fittings are for the fan drive pulley and for the idler (belt tightener).

i00803315

Final Drive Oil - Change

SMCS Code: 4050-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide”, for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

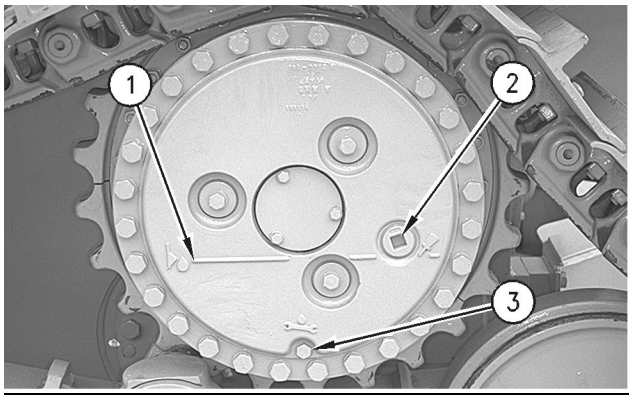


Illustration 182 g00100627

1. Position one final drive so that oil level mark (1) is horizontal. The drain plug (3) will point downward.
2. Remove drain plug (3). Allow the oil to drain into a suitable container.
3. Inspect the drain plug seal. Replace the drain plug seal if the drain plug seal is damaged.
4. Clean the drain plug and install the drain plug.
5. Remove oil filler plug (2).
6. Fill the final drive with oil to the bottom of the filler plug opening. See Operation and Maintenance Manual, “Refill Capacities”.
7. Inspect the condition of the seal of the filler plug. Replace the plug seal if the plug seal is damaged.
8. Repeat Step 1 to Step 7 in order to change the oil in the other final drive.

i01023410

Final Drive Oil Level - Check

SMCS Code: 4050-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

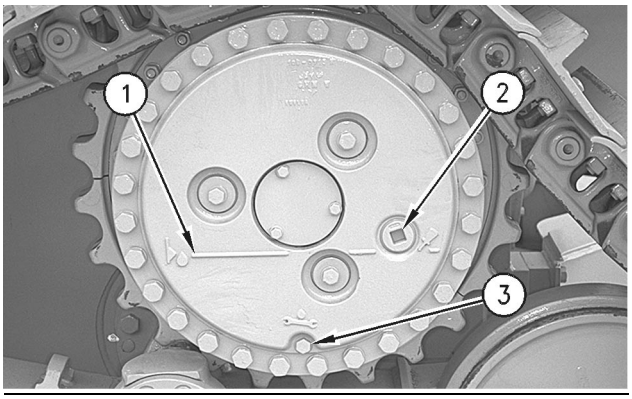


Illustration 183 g00100625

1. Position one final drive so that oil level mark (1) is horizontal and drain plug (3) is at the bottom.
2. Remove oil filler plug (2).
3. The oil level should be at the bottom of the filler plug opening. Add oil, if necessary.

   See the Table in the article “Lubricant Viscosities” for the type of oil.
4. Install oil filler plug (2).
5. Repeat Step 1 to Step 4 in order to check the oil level in the other final drive.

i01256760

Front Idler Position - Check

SMCS Code: 4159

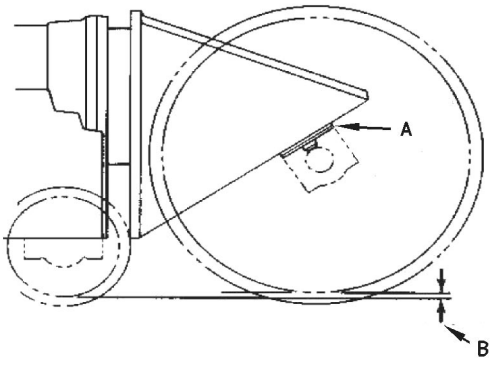


Illustration 184 g00669323

(A) Adjusting shims
(B) Dimension between the height of the front idler tread and the height of the roller tread

The height of the front idler tread should always be higher than the height of the roller tread. The dimension (B) is set approximately to 9.0 mm (.35 inch) at the factory. Dimension (B) decreases as the undercarriage wears. If a rebuilt idler or a new idler is installed with track rollers that are worn, dimension (B) decreases.

Adjustment of the front idler to the correct height can improve the ride of the tractor and the performance of the dozer. Use the following procedures to determine the best operating position.

If the machine is operated on FIRM UNDERFOOT conditions and excess vibration occurs, shims can be removed in order to raise the front idler.

If the machine is operated on SOFT UNDERFOOT conditions and dozing performance is poor, shims can be installed in order to lower the front idler. Lowering the front idler can improve dozing performance. If ground rippling by the dozer or excess vibration occur in soft material, shims can be removed in order to raise the front idler.

Consult your Caterpillar dealer for detailed information about checking the idler and about adjustments to the idler.

i01250960

Fuel System - Fill

SMCS Code: 1250-544

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Illustration 185 g00666728

The fuel tank is located at the rear of the machine. The tank cap for the fuel tank is located on the left side of the fuel tank. See Operation and Maintenance Manual, “Refill Capacities”.

Mounting and Dismounting the Machine

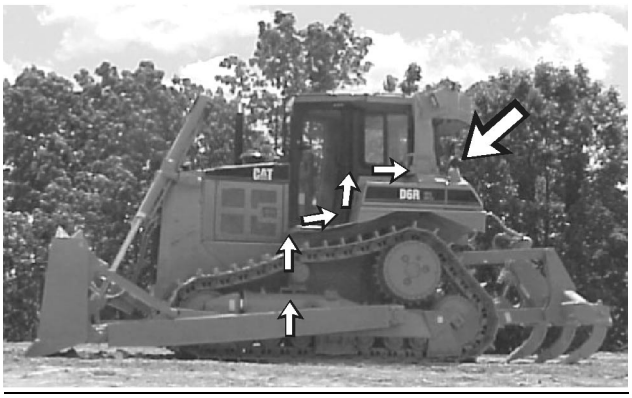


Illustration 186 g00666730

The following route is the correct path to the tank cap:

- Grasp the handhold on the fender.
- Step on the push arm.
- Step on the track shoes.
- Walk over the fender.
- Stand on the nonskid surface on the battery box.
- Hold the handhold on the ROPS support assembly with the left hand.

Fill the Fuel Tank

1. Clean the outside of the tank cap and the outside of the fuel tank filler neck.

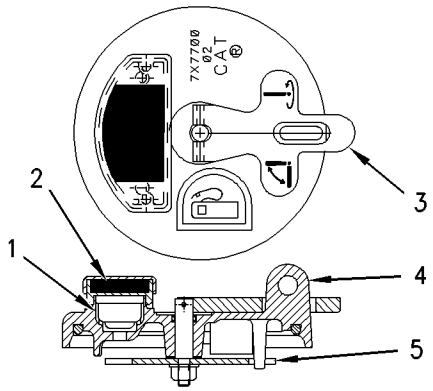


Illustration 187 g00668917

2. Lift lever (3) in order to remove the tank cap. Turn the lever counterclockwise until the lever stops. Lift the tank cap straight up in order to remove the tank cap.

3. Fill the fuel tank with fuel.

Inspect the Tank Cap and the Strainer

1. Remove the fuel strainer from the filler neck.

2. Inspect the strainer. If the strainer is damaged, replace the strainer.

3. If necessary, clean the strainer in a clean, nonflammable solvent.

4. Install the strainer.

5. If necessary, clean the inside of the tank cap.

6. Inspect the tank cap seal. If the seal is damaged, replace the seal.

7. Inspect tank cap filter (2) for damage. Replace tank cap filter (2) if the filter is damaged. Refer to the , “Fuel Tank Cap Filter and Strainer - Replace/Clean” procedure in the maintenance section of this manual.

8. Install the tank cap. Rotate the tank cap clockwise until three tabs (5) drop into the slots in the adapter. Rotate lever (3) clockwise until the lever stops. Lower lever (3) over locking tab (4).

i00072933

Fuel System - Prime

SMCS Code: 1258

If the engine does not start, air may be trapped in the fuel lines to the engine. Use the following procedure in order to purge air from the fuel lines.

Fuel Priming Pump (If Equipped)

The fuel priming pump is located in the engine compartment on the right side of the machine.

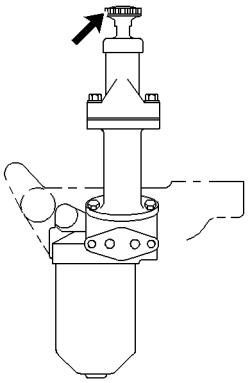


Illustration 188 g00103758

1. Unlock the priming pump plunger. Operate the plunger until you feel resistance.

2. Push in the plunger. Hand tighten the plunger.

3. Start the engine. If the engine does not start, or if the engine continues to misfire or smoke, additional priming is necessary.

4. Run the engine at the LOW IDLE position until the engine runs smoothly.

i00075818

Fuel System Primary Filter - Clean/Replace

SMCS Code: 1260-070-PY; 1260-510-PY; 1261

WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

WARNING

Personal injury or death can result from engine overspeed.

If the engine overspeeds, it can cause injury or parts damage.

Be prepared to stop the engine by closing the air off to the air inlets or by manually pushing downward on the governor shutdown rod.

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE
Do not fill fuel filter with fuel before installing the fuel filter. Contaminated fuel causes accelerated wear to fuel system parts.

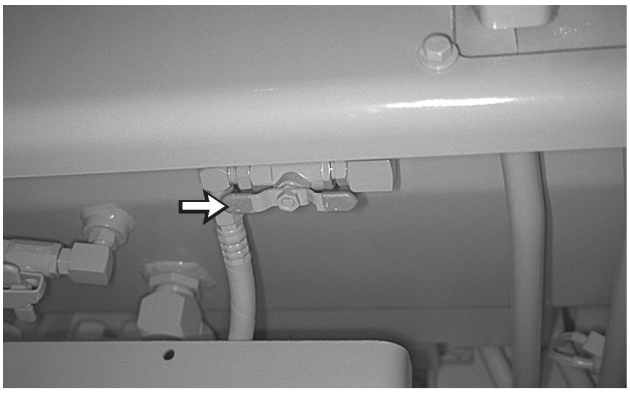


Illustration 189 g00103874

1. Open the access door (if equipped) at the rear of the machine. Turn the red handle of the fuel shutoff valve in order to shut off the fuel supply.
2. Open the access cover for the engine compartment. The access cover is located on the right side of the machine.

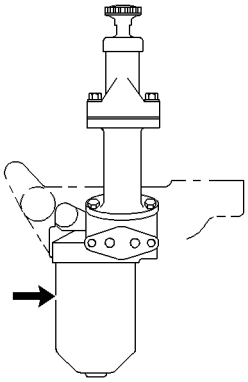


Illustration 190 g00103875

3. Remove the filter with a strap wrench.
4. Wash the filter mounting base in clean, nonflammable solvent. Make sure that all of the old seal is removed.
5. Coat the seal of the new filter element with clean diesel fuel.
6. Install the new filter element by hand. When the seal contacts the base, tighten the filter element for an additional 3/4 turn.

   Rotation index marks are positioned on the filter elements at 90 degree intervals. Use these rotation index marks as a guide when you tighten the filter.
7. Open the fuel shutoff valve. Close the access door (if equipped).

8. Prime the fuel system.

i00073327

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510-SE

WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

WARNING

Personal injury can result when using cleaner solvents.

To help prevent personal injury, follow the instructions and warnings on the cleaner solvent container before using.

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel system parts.

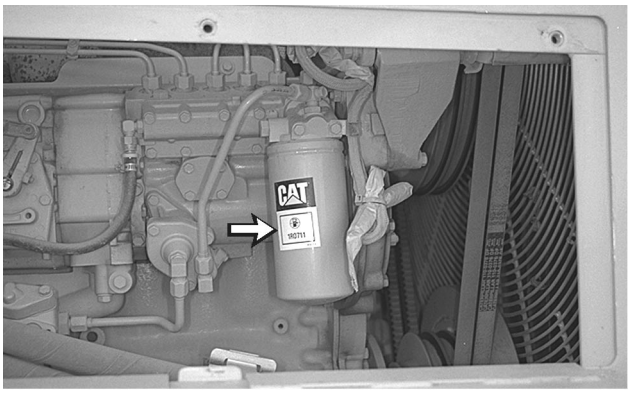


Illustration 191 g00103879

Before you replace the secondary fuel filter element, replace the primary fuel filter element.

The secondary fuel filter is behind the access door on the right side of the machine.

1. Shut off the fuel supply. The fuel shutoff valve is under the fuel tank on the rear of the machine.

2. Remove the filter element. Discard the filter element properly.

3. Clean the filter housing base. Make sure that all of the old seal is removed.

4. Coat the seal of the new filter element with clean diesel fuel.

5. Install the new filter element by hand. When the seal contacts the base, tighten the filter element for an additional 3/4 turn.

Rotation index marks are positioned on the filter element at 90 degree intervals. Use these rotation index marks as a guide when you tighten the filter.

6. Open the fuel shutoff valve.

7. Prime the fuel system.

i01256077

Fuel Tank Cap Filter and Strainer - Replace/Clean

SMCS Code: 1273-070-STR; 1273-070-Z2

Illustration 192 g00666728

The fuel cap is located on the rear of the machine. The cap is on the left side of the machine.

Only vented fuel caps have filters. Machines without the fast fill fuel arrangement require a vented fuel cap.

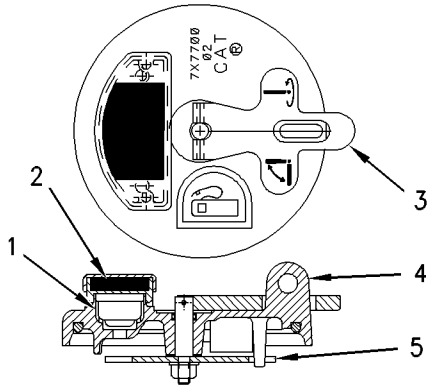


Illustration 193 g00668917

1. Lift lever (3) in order to remove the fuel tank filler cap. Turn the lever counterclockwise until the lever stops. Lift the cap straight up in order to remove the cap.
2. Remove the fuel strainer from the filler neck.
3. In order to remove the filter assembly, remove two screws that secure filter assembly (2) to the fuel cap. Remove filter assembly (2), valve (1), and the gaskets.
4. Wash the cap and the strainer in a clean, nonflammable solvent.
5. Inspect the tank cap seal. If the seal is damaged, replace the seal.
6. Replace the filter assembly, the valve, the gaskets, and the screws. Use a **9X-2205** Cap Filter Kit.
7. Install the strainer.
8. Install the fuel cap. Rotate the fuel cap clockwise until three tabs (5) drop into the slots in the adapter. Rotate lever (3) clockwise until the lever stops. Lower lever (3) over locking tab (4).

i00072950

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

The drain valve is under the fuel tank at the rear of the machine.

1. Open the access cover (if equipped).

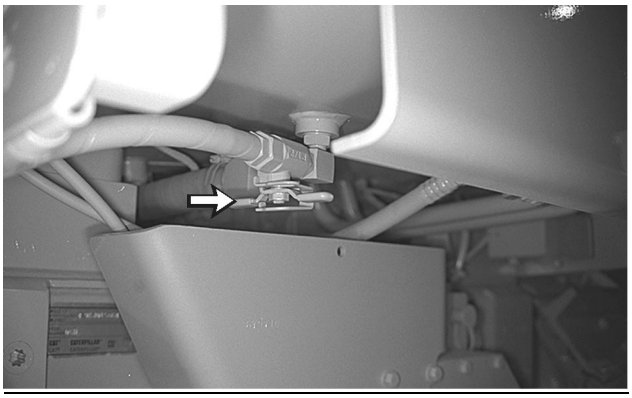


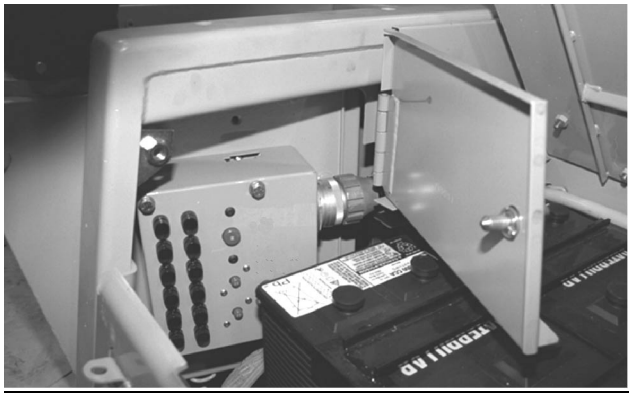
Illustration 194 g00103760

2. Open the drain valve. Allow the water and the sediment to drain into a suitable container.
3. Close the drain valve. Close the access cover (if equipped).

i00753704

Fuses - Replace

SMCS Code: 1417-510



g00340187

Illustration 195

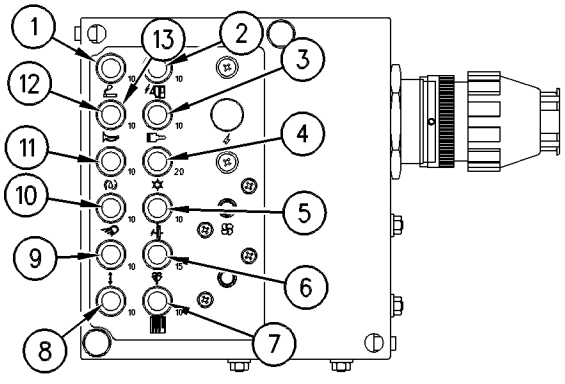
The fuse panel is located in the battery compartment on the left side of the machine.

Fuses – Fuses protect the electrical system from damage that is caused by overloaded electrical circuits. Replace a fuse if the element separates. If the fuse of a particular electrical system requires frequent replacement, check the electrical circuit. Repair the electrical circuit, if necessary.

NOTICE
Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE
If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Caterpillar dealer.



g00103744

Illustration 196

Cigar Lighter (1) – 10 Amp

Electrical Power for Cab (2) – 10 Amp

Key Start Switch (3) – 10 Amp

Air Conditioner (4) – 20 Amp

Electronic Clutch/Brake (5) – 10 Amp

Windshield Wiper/Washer (6) – 15 Amp

Caterpillar Monitoring System Panel (7) – 10 Amp

Auxiliary Circuit (8) – 10 Amp

Directional Control (9) – 10 Amp

Flood Lights (10) – 10 Amp

Brake System (11) – 10 Amp

Horn (12) – 10 Amp

Dump Valve (13) – 10 Amp

i00751877

Hydraulic System Oil - Change

SMCS Code: 5050-044

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly in order to relieve pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide”, for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Operate the machine in order to warm the oil.

Park the machine on level ground. Lower the bulldozer blade to the ground and apply slight downward pressure. Lower the ripper (if equipped) to the ground. Engage the parking brake and stop the engine.

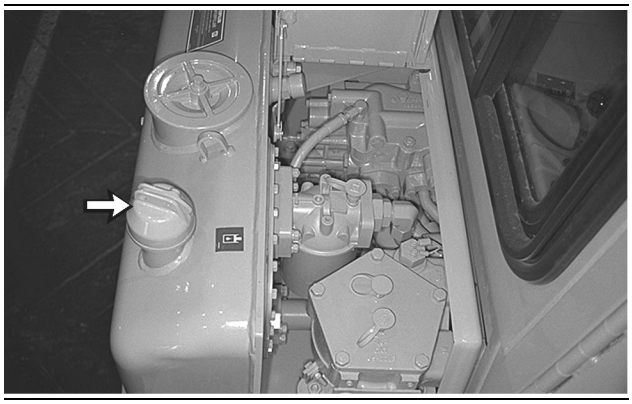


Illustration 197 g00103762

1. Remove the hydraulic tank filler cap slowly in order to relieve any pressure.
2. Wash the filler strainer and the filler cap in a clean nonflammable solvent.

Illustration 198 g00103763

3. Remove the oil drain plug. The oil drain plug is located under the right rear of the machine.
4. Attach a hose to a 1 inch NPT pipe nipple. This 1 inch NPT pipe nipple should have a length of 100 mm (4 inch).
5. Install the pipe nipple into the drain plug opening.
6. Rotate the pipe nipple clockwise in order to open the internal drain valve. Allow the oil to drain into a suitable container.
7. Remove the pipe nipple. The internal drain valve for the hydraulic tank will close.
8. Clean the drain plug and install the drain plug. Tighten the drain plug to a torque of 68 ± 7 N·m (50 ± 5 lb ft).
9. See Operation and Maintenance Manual, “Hydraulic System Oil Filter - Replace”. Change the hydraulic system filter.
10. Install the filler strainer.
11. See Operation and Maintenance Manual, “Refill Capacities” in order to determine the amount of hydraulic oil that is needed to fill the hydraulic oil tank. Fill the hydraulic oil tank.
12. Inspect the filler cap gasket. Replace the gasket if damage or wear is evident.
13. Install the filler cap.
14. Start the engine. Run the engine for a few minutes.

Illustration 199 g00103764

15. Maintain the oil level to the “FULL” mark in the sight gauge. Add oil, if necessary.

16. Stop the engine.

i00751928

Hydraulic System Oil Filter - Replace

SMCS Code: 5068-510

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly in order to relieve pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide”, for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

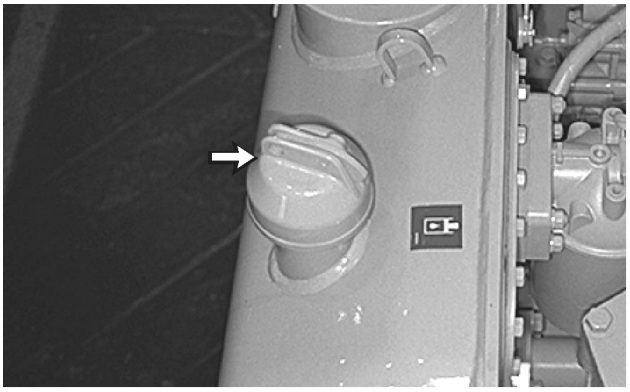


Illustration 200 g00103768

1. Slowly remove the hydraulic tank filler cap in order to relieve the system pressure.

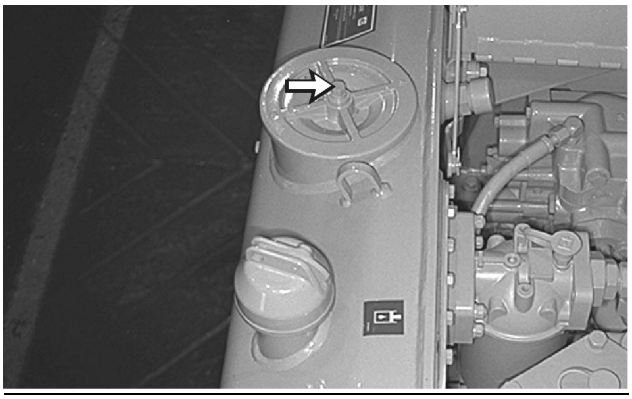


Illustration 201 g00103769

2. Remove the retaining nut.

3. Remove the cover and the filter assembly.

4. Remove the filter element. Properly discard the filter element.

Apply a thin coat of oil to the seal on the new filter.

5. Install the filter element by hand. When the seal contacts the base, tighten the filter element for an additional 3/4 turn.

6. Remove the retainer ring from the oil filler tube.

7. Remove the strainer from the oil filler tube.

8. Wash the screen in a clean nonflammable solvent.

9. Inspect the seal on the filler cap. Replace the seal if the seal is worn or if the seal is damaged.

10. Install the strainer, the retainer ring, and the cap.

Illustration 202 g00103770

11. Maintain the hydraulic oil to the “FULL” mark in the sight gauge.

Replace The Case Drain Filter

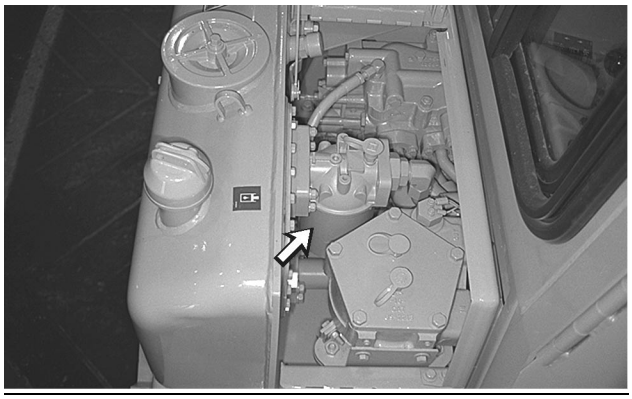


Illustration 203 g00103998

1. Open the access door that is located between the hydraulic tank and the operator’s compartment.

2. Remove the used filter element. Discard the used filter element.

3. Install the new filter element. Turn the element until the element contacts the filter base. Then, tighten the element for an additional 3/8 to 1/2 turn.

i00072797

Hydraulic System Oil Level - Check

SMCS Code: 5056-535-FLV; 7479

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Relieve the filler cap slowly to relieve pressure.

The hydraulic tank is on the right rear side of the machine.

Illustration 204 g00103732

1. Maintain the oil level to the “FULL” mark in the sight gauge.

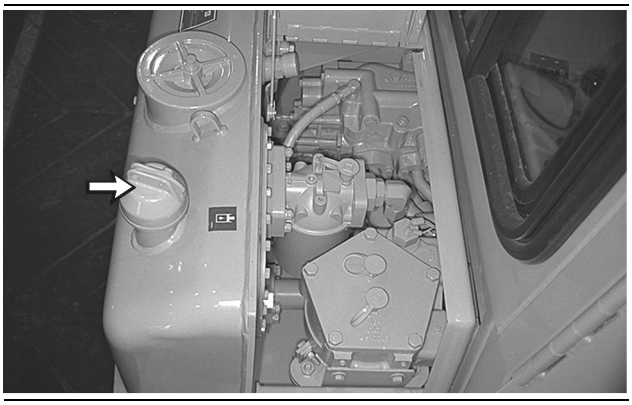


Illustration 205 g00103733

2. If the hydraulic system requires additional hydraulic oil, remove the filler cap and add oil through the filler tube.

3. Clean the filler cap and install the filler cap.

i01216225

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008; 7542-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Obtain the hydraulic oil sample as close as possible to the recommended sampling interval. The recommended sampling interval is every 500 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

If the machine is operated under a high load and/or under high temperature conditions, sample all fluids at the 250 hour interval.

1. Open the access cover on the right side of the cab.

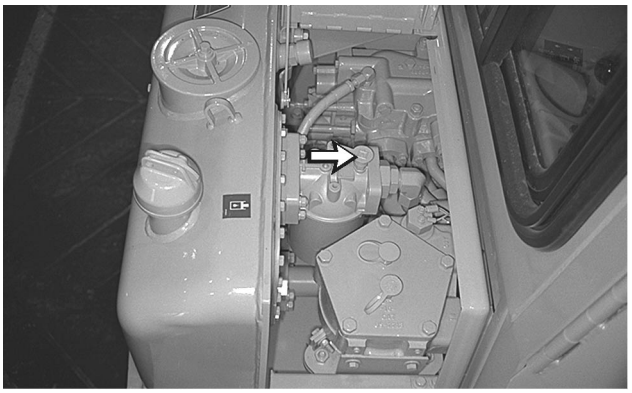


Illustration 206 g00103911

The hydraulic oil sampling valve is shown.

2. Remove the protective cap.

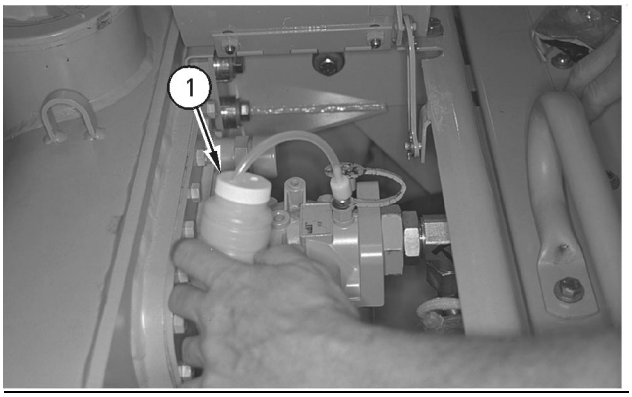


Illustration 207 g00318583

3. Use 8T-9190 Fluid Sampling Bottle (1) to obtain the sample.

4. After you take a sample, remove the cap with the probe from the bottle. Discard the cap with the probe. Install the sealing cap that is provided with 8T-9190 Fluid Sampling Bottle (1).

5. Replace the protective cap.

6. Install the access cover.

Reference: Refer to , “Lubricant Viscosities” in the Maintenance Section of this manual for the correct fluid for your machine.

i00072423

Lift Cylinder Yoke Bearings - Lubricate

SMCS Code: 5102-086-BD

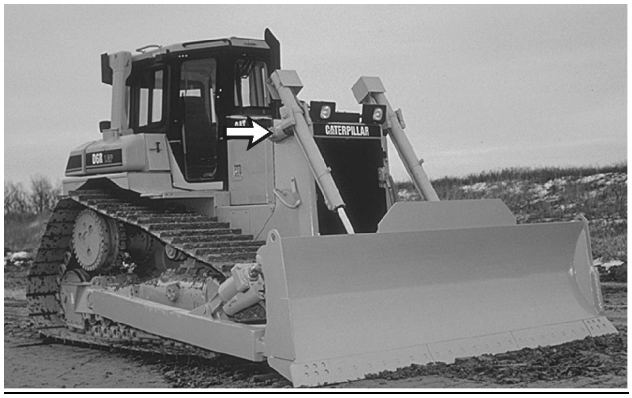


Illustration 208 g00103662

The fittings are on the left front side of the machine and on the right front side of the machine. Lubricate the bearings by applying grease to the fittings.

i00060978

Oil Filter - Inspect

SMCS Code: 1318-507; 3067-507; 5068-507

Inspect A Used Filter for Debris

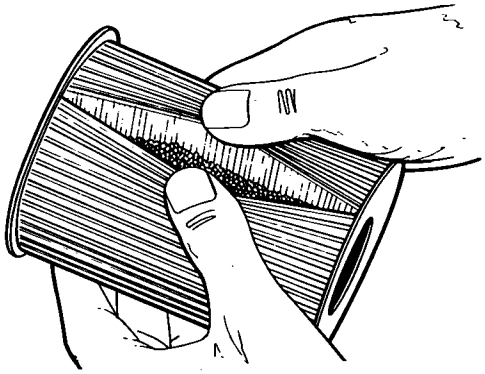


Illustration 209 g00100013

The element is shown with debris.

Use a **4C-5084** Filter Cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i00072817

Pivot Shaft Oil Level - Check

SMCS Code: 4153-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

Illustration 210 g00103736

The oil plugs are located on both sides of the machine on top of the track roller frame.

Remove the plug on one side of the machine. Check the oil level. The oil level should be at the bottom of the threaded hole. If necessary, add oil in order to bring the oil level up to the bottom of the threaded hole.

Repeat the procedure on the other side of the machine.

i00058126

Radiator Core - Clean

SMCS Code: 1353-070; 1805; 1810

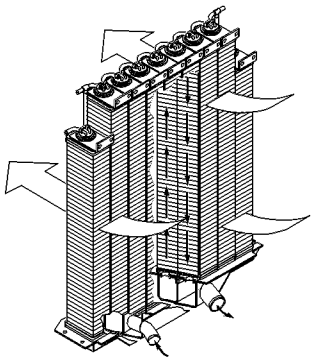


Illustration 211 g00100624

You can use compressed air, high pressure water, or steam to remove dust and other debris from the radiator core. However, the use of compressed air is preferred.

See Special Publication, SEBD0518, “Know Your Cooling System” for the complete procedure for cleaning the radiator core.

i00058123

Radiator Pressure Cap - Clean/Replace

SMCS Code: 1353-070-Z2; 1353-510-Z2

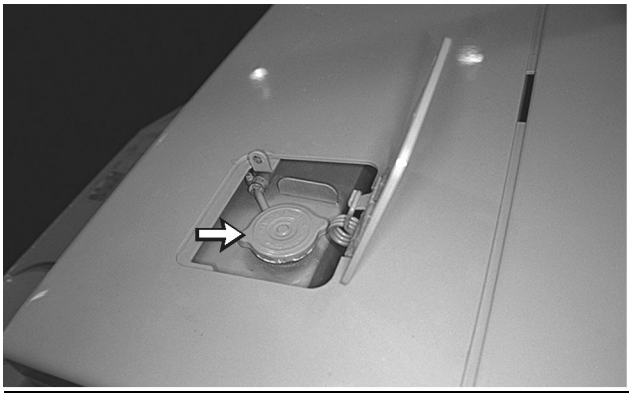


Illustration 212 g00100622

1. Slowly remove the radiator cap in order to relieve system pressure.
2. Inspect the radiator cap for damage, for deposits, or for foreign material. Clean the radiator cap with a clean cloth. Replace the radiator cap if the radiator cap is damaged.
3. Install the radiator cap.

i00072383

Recoil Spring Compartment Oil Level - Check

SMCS Code: 4158-535

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

1. Remove the cover plate for the oil filler.

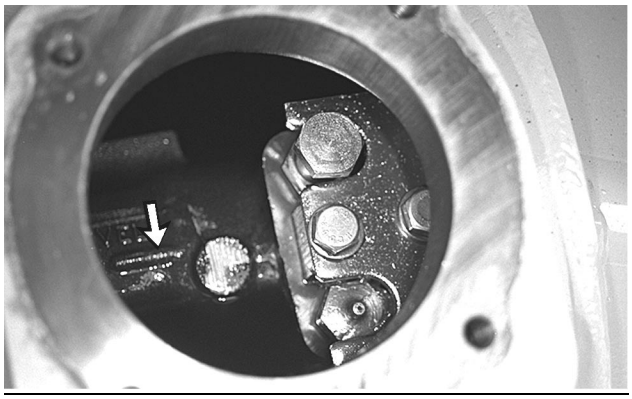


Illustration 213 g00100922

2. Maintain the oil level to the level mark on the dipstick.

3. Install the cover plate.

4. Repeat the procedure for the other recoil compartment.

i00072976

Ripper Linkage and Cylinder Bearings - Lubricate

SMCS Code: 6313-086-BD, L4

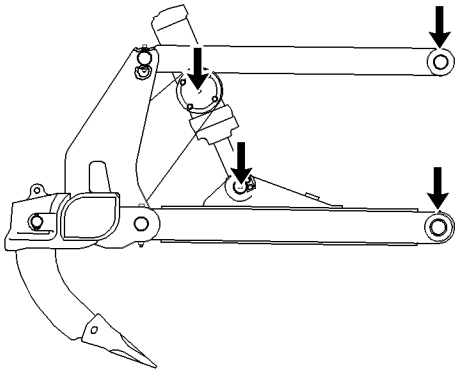


Illustration 214 g00103773

Lubricate eleven grease fittings.

i00925689

Ripper Tip and Shank Protector - Inspect/Replace

SMCS Code: 6808-040; 6808-510; 6810; 6812-040; 6812-510

If equipped:

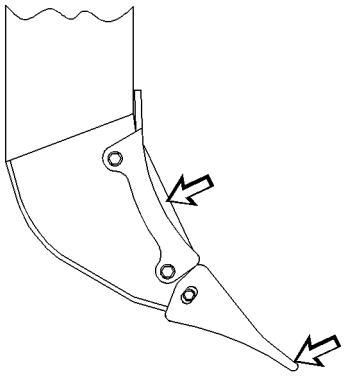


Illustration 215 g00550432

When the ripper tip is worn close to the shank, replace the ripper tip. When the shank protector is worn close to the shank, replace the shank protector. If the tip is too blunt, the tip will not penetrate properly.

1. Raise the ripper. Place blocking under the ripper. Lower the ripper onto the blocking. The ripper should be high enough so that the ripper tip or the shank protector can be removed. Do not place the ripper too high.

2. If the ripper tip is worn, drive out the pin. Remove the tip and the shank pin retainer.

3. Clean the shank pin retainer and the pin.

4. Install the new tip and the retainer.

5. Install the pin from the opposite side of the retainer.

6. If the shank protector is worn, drive out the pins. Remove the shank protector.

7. Clean the pin retainers and the pins.

8. Install the new shank protector and the retainers.

9. Install the pins from the opposite side of the retainer.

10. Raise the ripper and remove the blocking.

11. Lower the ripper to the ground.

i00949666

Rollover Protective Structure (ROPS) - Inspect

SMCS Code: 7325-040

Illustration 216 g00103787

Inspect the Rollover Protective Structure (ROPS) for bolts that are loose or damaged. Replace any damaged bolts and any missing bolts with original replacement parts only. Tighten the bolts to a torque of 900 ± 100 N·m (660 ± 75 lb ft).

Note: Apply oil to all bolt threads for the ROPS before you install the bolts. Improper bolt torque can result if you do not apply oil to the threads.

Do not weld reinforcement plates to the ROPS in order to straighten the ROPS. Do not weld reinforcement plates to the ROPS in order to repair the ROPS.

If the ROPS has any cracks in the welds, in the castings, or in any metal section, consult your Caterpillar dealer for repairs.

i00038410

Seat Belt - Inspect

SMCS Code: 7327-040

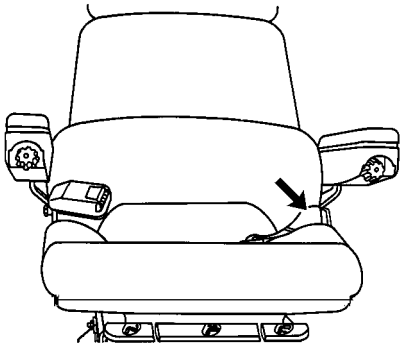


Illustration 217 g00040782

Always check the condition of the seat belt and the condition of the belt mounting hardware before you operate the machine.

Inspect the belt mounting hardware. Replace any belt mounting hardware that is damaged or worn.

Regardless of the appearance, replace the seat belt once during every three year interval.

i00073972

Torque Converter Scavenge Screen - Clean

SMCS Code: 3101-070-MGS; 3105

When you change the transmission oil, clean the torque converter scavenge screen.

1. Remove the bottom guard in order to gain access to the torque converter.

2. Disconnect the hose from the torque converter housing.

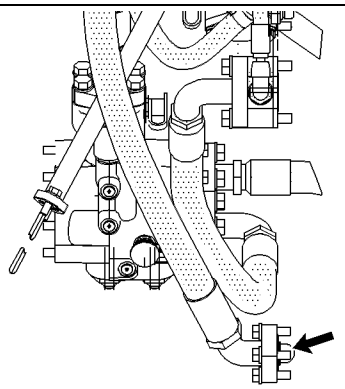


Illustration 218 g00104059

3. Remove the screen from the torque converter housing.

4. Wash the screen in a clean, nonflammable solvent.

5. Install the screen in the torque converter housing.

6. Connect the hose to the torque converter housing.

7. Install the bottom guard.

i01193190

Track Adjustment - Adjust

SMCS Code: 4170-025

Procedure

⚠ WARNING

Grease is under high pressure.

Grease coming out of the relief valve under pressure can penetrate the body causing injury or death.

Do not watch the relief valve to see if grease is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

Loosen the relief valve only one turn.

Follow these steps in order to adjust the tension of the track:

1. Move the machine forward. Allow the machine to stop without the use of the service brakes. Adjust the tracks while you are in the machine's typical operating conditions. If packing conditions prevail in the workplace, adjust the tracks with packing material on the tracks.

2. Make sure that the sag in the track is between the sprocket and the front idler. Park the machine and shut off the engine.

3. Establish a straight line from the grouser at the sprocket to the grouser at the front idler. See Illustration 219.

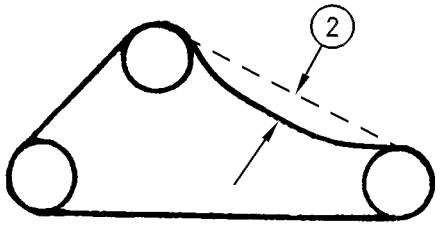


Illustration 219 g00040329

4. If a machine does not have track carrier rollers, the sag in the track is measured between the sprocket and front idler (2). The correct adjustment of dimension (2) is 115 ± 10 mm (4.5 ± 0.4 inch).

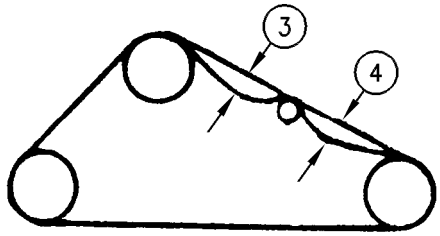


Illustration 220 g00104000

5. If the machine is equipped with track carrier rollers, calculate the average of dimension (3) and dimension (4). The correct average value is 55 ± 10 mm (2.2 ± 0.4 inch).

Loose Track Adjustment

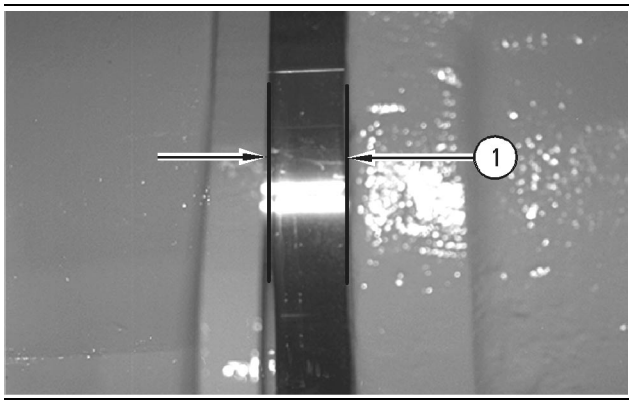


Illustration 221 g00040335

NOTICE
Do not attempt to tighten track when dimension (1) is 150 mm (5.9 inch) or more.

Contact your Caterpillar dealer for track service or instructions.

1. Remove the access cover.

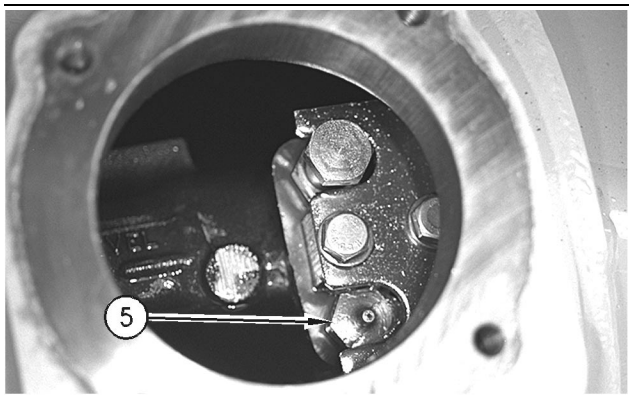


Illustration 222 g00104001

2. Add multipurpose grease (MPGM) through track adjustment valve (5). Add the MPGM until dimension (2) is correct.

3. Operate the machine back and forth in order to equalize the pressure. Allow the machine to coast to a complete stop. Do not use the brakes.

4. Measure dimension (2) again.

5. Install the access cover.

Tight Track Adjustment

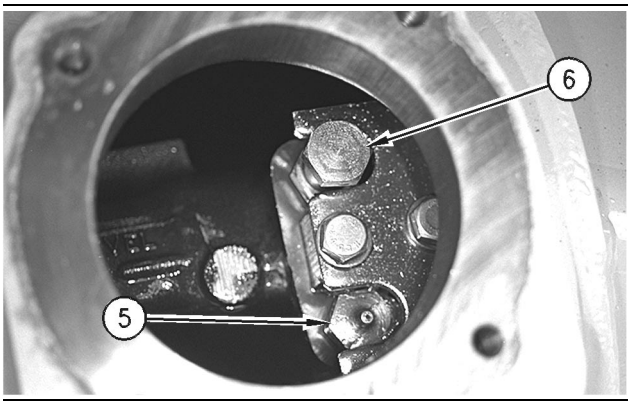


Illustration 223 g00104002

1. Remove the access cover.

2. Loosen relief valve (6) by one turn of 360 degrees. Allow the grease to escape.

3. Close the relief valve.

4. Add MPGM through track adjustment valve (5). Add grease until dimension (2) is correct.

5. Operate the machine back and forth in order to equalize the pressure. Allow the machine to coast to a complete stop. Do not use the brakes.

6. Measure dimension (2) again. Repeat Steps **4** and **5** until dimension (2) is correct.

7. Install the access cover.

Bolt Torque for Track Shoes

The torque requirement for track shoe bolts is 400 ± 70 N·m (300 ± 50 lb ft). Tighten the bolts by an additional turn of 120 degrees. If you are using bolts with a master link, tighten the bolts to a torque of 400 ± 70 N·m (300 ± 50 lb ft). Then, tighten the bolts by an additional turn of 180 degrees.

i00073031

Track Adjustment - Check

SMCS Code: 4170-535

Illustration 224 g00103790

Check the track adjustment. Check the track for wear and for excessive dirt buildup.

If the track appears to be too tight or too loose, see Operation and Maintenance Manual, “Track Adjustment - Adjust”.

i01123943

Track Pins - Inspect

SMCS Code: 4175-040-PN

WARNING

Fingers can be burned from hot pins and bushings.

The pins and bushings in a dry joint can become very hot. It is possible to burn the fingers if there is more than brief contact with these components.

Use the recommendations in order to extend the life of the undercarriage. Use the recommendations in order to avoid excessive downtime.

1. During the machine operation, listen for unusual squeaking and for unusual squealing. This can indicate a dry joint.

2. Check the machine for dry joints weekly. Check for dry joints immediately after machine operation. After machine operation, lightly touch the end of each track pin or bushing. Touch the track pin or the track bushing with the back of your hand. Make a mark on any dry track pin joint that is very hot to the touch.

3. Do not hit the ends of the track pins with a sledge hammer in order to loosen the track joints.

NOTICE
Striking the end of a track pin introduces a significant amount of end play into the track joint and can result in early failures.

Consult your Caterpillar dealer’s Custom Track Service expert if you detect dry joints or leaks. Your Caterpillar dealer’s Custom Track Service expert can perform track inspection.

i00073058

Track Roller Frame - Inspect

SMCS Code: 4151-040

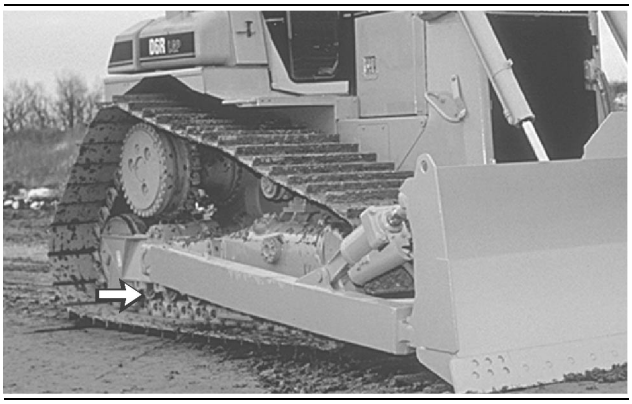


Illustration 225 g00103791

Inspect the track roller frame for leaks. Check the seal for the pivot shaft for leaks. Check the track rollers for leaks.

i01508708

Track Roller Frame Guides - Inspect

SMCS Code: 4177-040

Measure the rotational movement of the front roller frame relative to the rear roller frame.

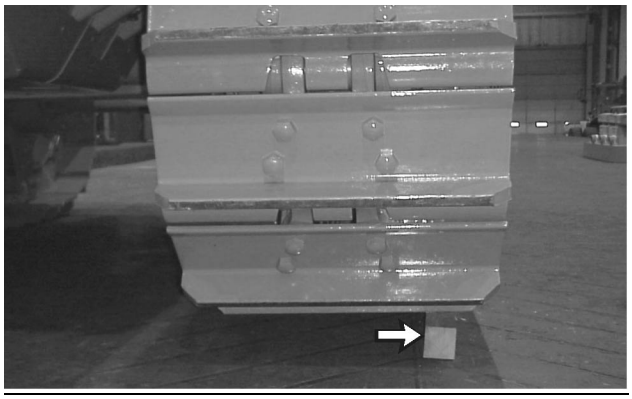


Illustration 226 g00581644

1. Raise the front of the machine with the hydraulics of the dozer. Place a 100 mm (4 inch) block under the outside edge of a track grouser. Place the block near the track idler. Lower the machine onto the block.

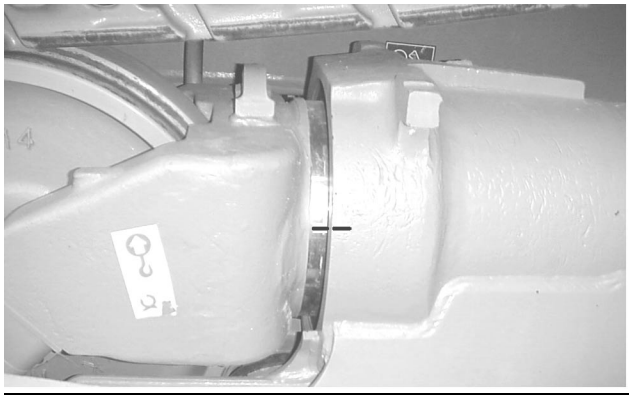


Illustration 227 g00781096

2. Use a grease pencil to make a mark on the tubular section of the front roller frame. Make a mark on the rear of the roller frame. This mark should correspond with the mark that is on the tubular section.

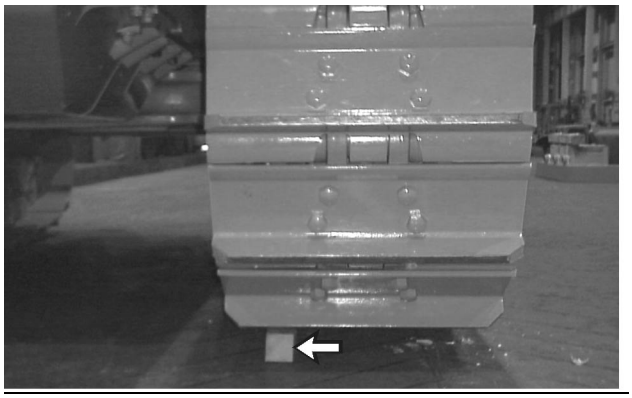


Illustration 228 g00581643

3. Raise the front of the machine with the hydraulics of the dozer. Place the block under the inside edge of the same track grouser. Lower the machine onto the block.

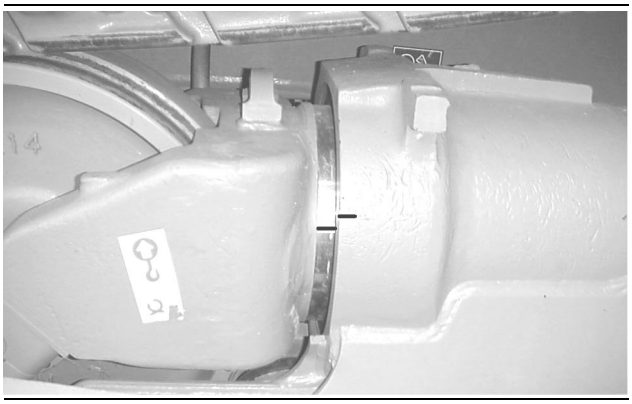


Illustration 229 g00781106

4. Put a mark on the tubular section of the front roller frame. This mark should correspond with the mark on the rear roller frame. Measure the distance between the two marks on the front roller frame.

If the distance between the two marks is greater than 4.5 mm (0.18 inch), inspect the track roller frame guides for wear.

Repeat the entire procedure for the other side of the machine.

NOTICE

Never build up the track roller frame guides with hard-face welding. This will cause serious wear damage to the guide slots in the front track roller frame.

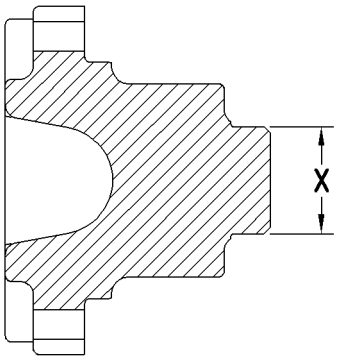


Illustration 230 g00781090

Track Roller Frame Guide

If the dimension (X) is less than 45.3 mm (1.78 inch), replace the track roller frame guides.

Reference: Refer to Disassembly and Assembly, “Track Roller Frame Guides - Remove and Install” in the Service Manual for your machine, or consult your Caterpillar dealer for information or for service.

i01146867

Transmission Magnetic Screen - Clean

SMCS Code: 3030-070-MGS

When you change the transmission oil, clean the magnet assembly and the screen.

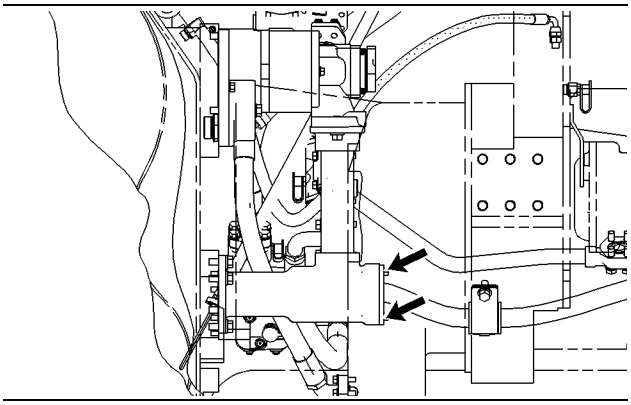


Illustration 231 g00103746

1. Remove the bottom guard for access to the screen group.
2. Remove the nuts which hold the cover to the housing.
3. Remove the screen and the magnet assembly from the housing.
4. Wash the screen and the magnet assembly in a clean, nonflammable solvent.
5. Inspect the seal. If the seal is damaged, install a new seal.
6. Install the screen and the magnet assembly.
7. Install the cover on the screen housing.
8. Install the bottom guard.

i00073011

Transmission Oil - Change

SMCS Code: 3030; 3080-044

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

Operate the engine in order to warm the oil. Park the machine on level ground. Lower all implements to the ground. Apply slight downward pressure.

Engage the parking brake switch. Stop the engine.

Some machines may be equipped with ecology drain valves.

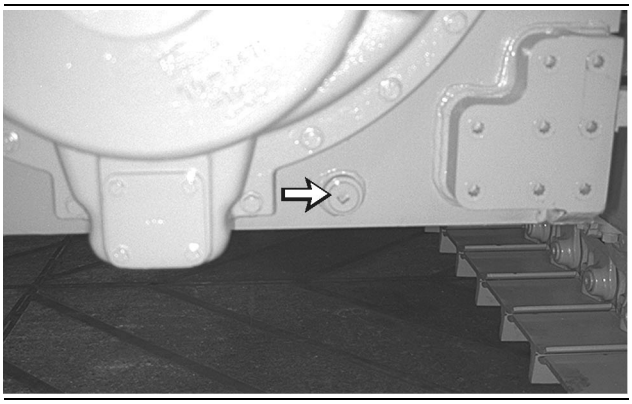


Illustration 232 g00103783

1. Remove the transmission oil drain plug. Drain the oil into a suitable container.
2. Clean the transmission oil drain plug and install the transmission oil drain plug.
3. Change the filter element. See Operation and Maintenance Manual, “Transmission Oil Filter - Replace”.
4. Clean the transmission magnetic screen. See Operation and Maintenance Manual, “Transmission Magnetic Screen - Clean”.
5. Open the engine access door for the transmission oil filler cap. The engine access door is on the left side of the machine.

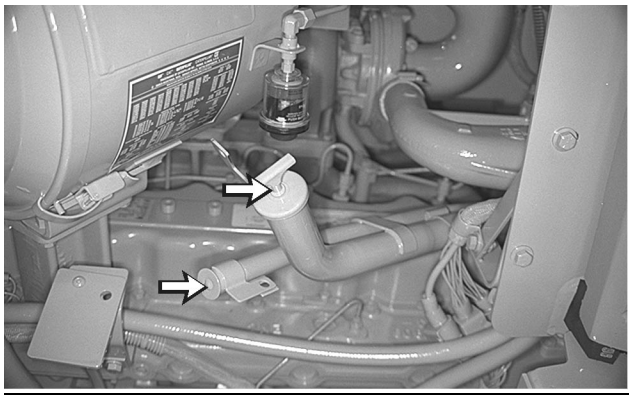


Illustration 233 g00103782

6. Remove the transmission oil filler cap.

7. Add oil. To determine the correct amount of oil, see Operation and Maintenance Manual, “Refill Capacities”.

8. Clean the transmission oil filler cap and install the transmission oil filler cap.

9. Maintain the oil level to the “FULL” mark on the dipstick.

Illustration 234 g00103784

10. Unscrew the transmission breather and remove the transmission breather. The transmission breather is located on the top of the bevel gear case. Remove the floorplate in order to access the transmission breather.

11. Wash the transmission breather in a clean nonflammable solvent.

12. Install the transmission breather.

i01193617

Transmission Oil Filter - Replace

SMCS Code: 3067-510

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Initially, replace the transmission oil filter after 250 service hours. Also, replace the transmission oil filter after the initial 500 service hour interval. Thereafter, replace the transmission oil filter after every 500 service hours.

Replace the filter element if the transmission oil filter indicator comes on during operation.

The transmission oil filter is located behind the access cover on the right side of the machine.

Illustration 235 g00104052

1. Remove the filter housing drain plug. The filter housing drain plug is located under the fender on the right side of the machine. Drain the oil into a suitable container. Reinstall the filter housing drain plug.

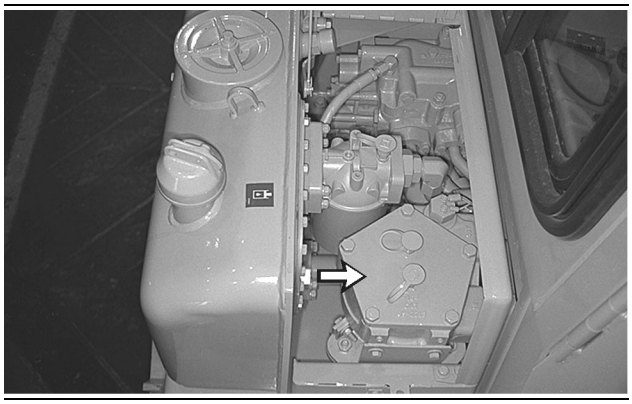


Illustration 236 g00103792

2. Remove the filter element cover.
3. Remove the filter element and properly discard the filter element.
4. Clean the filter element housing with a clean cloth.
5. Inspect the seal. If the seal is damaged, replace the seal.
6. Install the new filter element. Install the filter element housing cover.
7. Start the engine.

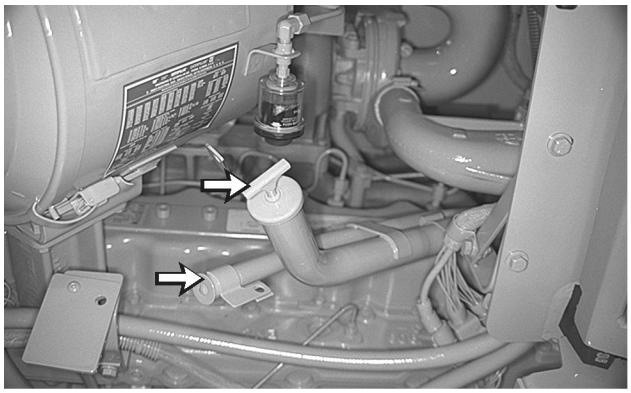


Illustration 237 g00103793

8. Maintain the oil level to the “FULL” mark on the dipstick. If necessary, add oil through the filler tube.
9. Stop the engine.

i01174960

Transmission Oil Level - Check

SMCS Code: 3030-535-FLV; 3080-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

The transmission oil dipstick is behind the engine access cover on the left fender of the machine.

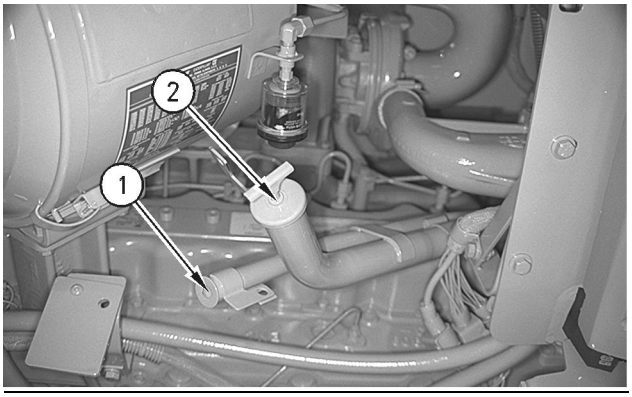


Illustration 238 g00103780

1. Open the engine access cover. Check dipstick (1) while the engine is operating at low idle and while the oil is at operating temperature. Maintain the oil between the “ADD” mark and the “FULL” mark.

Note: When you are operating the machine on severe slopes, the quantity of oil in the transmission can be increased up to 10 percent. When you are operating with the increased oil quantity, prolonged operation in some machines can cause high transmission oil temperatures. After the work on the severe slopes has been completed, drain the excessive oil quantity from the bevel gear case.

2. Remove filler cap (2). If necessary, add oil.
3. Clean the filler cap. Install the filler cap.

   Replace the filter element if the transmission oil filter indicator comes on during operation.

   Reference: Refer to Operation and Maintenance Manual, “Transmission Oil Filter - Replace” in this manual.
4. Close the engine access cover.

i01216235

Transmission Oil Sample - Obtain

SMCS Code: 3030-008; 7542-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the transmission oil as close as possible to the recommended sampling interval. The recommended sampling interval is every 500 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

If the machine is operated under high load and/or under high temperature conditions, sample all fluids at the 250 hour interval.

1. Open the access cover on the right side of the cab.

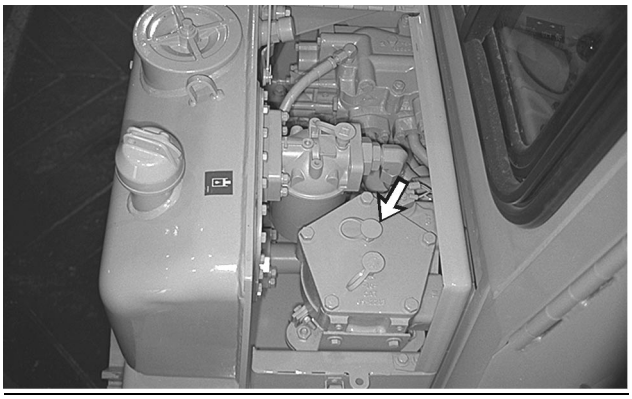


Illustration 239 g00318943

The oil sampling valve for the power train is shown.

2. Remove the protective cap.

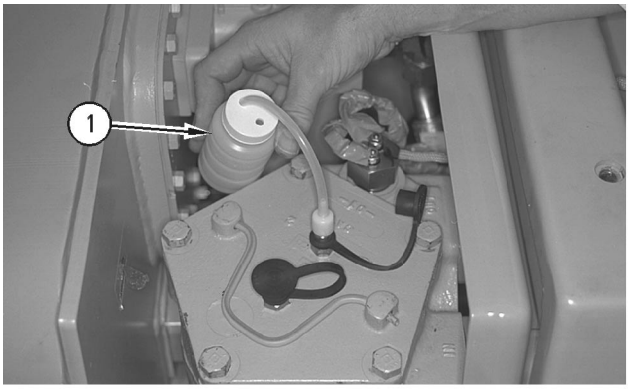


Illustration 240 g00318825

3. Use 8T-9190 Fluid Sampling Bottle (1) to obtain a sample.

4. After you take a sample, remove the cap with the probe from the bottle. Discard the cap with the probe. Install the sealing cap that is provided with 8T-9190 Fluid Sampling Bottle (1).

5. Replace the protective cap.

6. Install the access cover.

Reference: Refer to , “Lubricant Viscosities” in the Maintenance Section of this manual for the correct fluid for your machine.

i00073242

Transmission Scavenge Screen - Clean

SMCS Code: 3030-070-MGS

When you change the transmission oil , clean the scavenge screen.

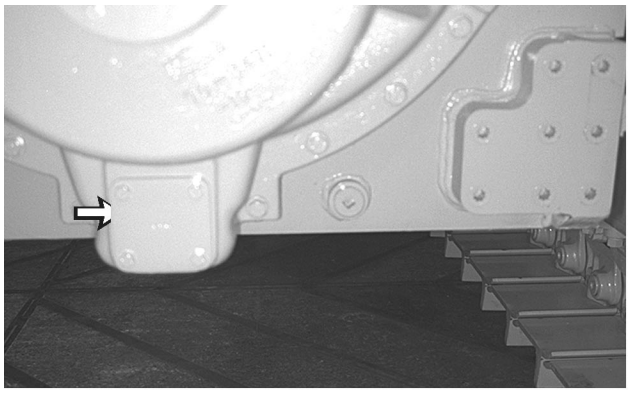


Illustration 241 g00104061

1. Remove the cover from the rear of the transmission. The scavenge screen is located behind the cover.
2. Wash the screen in a clean, nonflammable solvent.
3. Inspect the seal. If the seal is damaged, replace the seal.
4. Install the screen and the cover.

i01499083

Trunnion Bearing - Adjust

SMCS Code: 6063-025

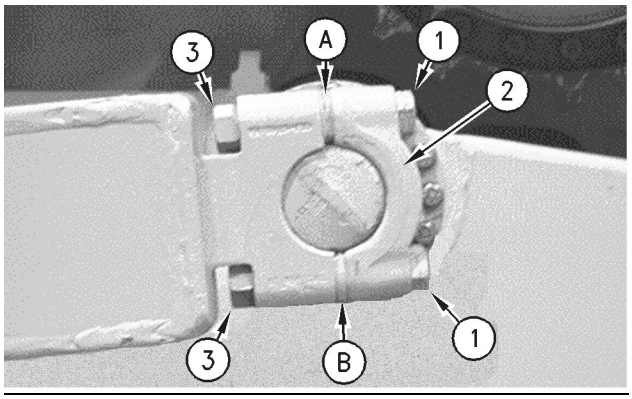


Illustration 242 g00666217

Adjust the trunnion bearings after the initial 100 hours.

1. Lower the bulldozer blade to the ground. Walk to the left side of the machine.
2. Remove two nuts (3) from two bolts (1) on the trunnion bearing.
3. Remove two bolts (1), bearing cap (2), and two shim packs (A and B) as a unit.
4. Remove one shim from each shim pack (A and B).
5. Install two bolts (1), bearing cap (2), and two shim packs (A and B).
6. Install two nuts (3) on two bolts (1).
7. Tighten two nuts (3) to a torque of 1050 ± 150 N·m (775 ± 110 lb ft).
8. Repeat steps 2 through 7 on the right side of the machine.

Procedure for Shimming

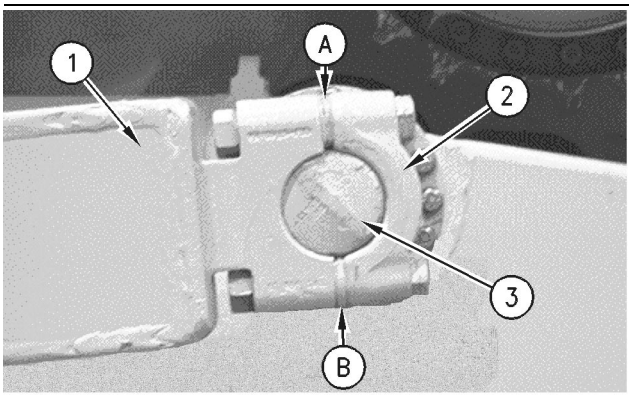


Illustration 243 g00292740

Typical example

1. Remove all of the shims from push arm assembly (1).
2. Install assembly (1) and cap (2) on trunnion assembly (3) without shims.
3. Tighten the bolts that are on cap (2) to a torque of 50 N·m (37 lb ft).

   Maintain equal distance on both space (A) and space (B) of cap (2). Observe spaces (A) and (B) in order to determine the required number of shims.
4. Loosen the bolts that are on cap (2). As needed, insert shims into spaces (A) and (B). When possible, use an equal number of shims for spaces (A) and (B).

Note: The number of shims at space (A) must be within one of the number of shims at space (B). For example, if space (A) has eight shims, space (B) must have seven, eight, or nine shims.

5. Add one additional shim to space (A). Add one additional shim to space (B).

6. Tighten the bolts that are on cap (2) to a torque of 1050 ± 150 N·m (775 ± 110 lb ft).

7. The assembly should move freely on the trunnion. The specified minimum tolerance is 0.25 mm (0.010 inch).

Note: Removal of one or more shims after a short period of time may be necessary. Wear can be caused by normal variations of the surface or variations in the thickness of the paint.

8. Perform Steps **1** through **5** on the front bearing.

9. Tighten the bolts that are on the front bearing to a torque of 430 ± 60 N·m (320 ± 45 lb ft).

10. The assembly should move freely on the trunnion. The specified minimum tolerance is 0.25 mm (0.010 inch).

Note: Removal of one or more shims after a short period of time may be necessary. Wear can be caused by normal variations of the surface or variations in the thickness of the paint.

i00073262

Walk-Around Inspection

SMCS Code: 7000-040

NOTICE

Accumulated grease and oil on a machine is a fire hazard.

Remove debris with steam cleaning or high pressure water, at the specified interval in the Maintenance Interval Schedule or each time any significant quantity of oil is spilled on the machine.

Note: Watch closely for leaks. If leaking is observed, find the source of the leak and correct the leak. If leaking is suspected or leaking is observed, check the fluid levels more frequently.

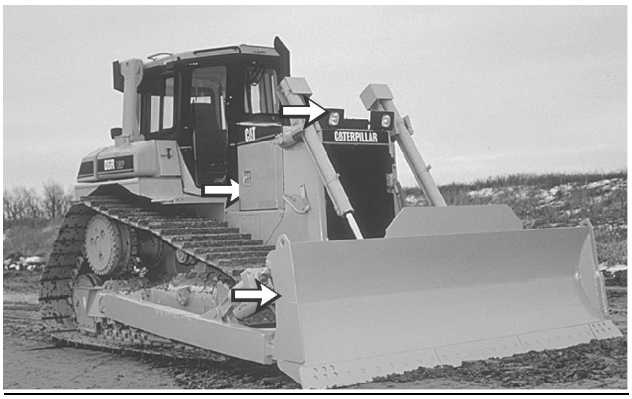


Illustration 244 g00103813

- Inspect all of the implements for damage or for excessive wear. Repair the implements if the implements are damaged.
- Inspect the attachment cylinders and the attachment linkage for damage or for excessive wear. Repair any damages.
- Inspect the lights for broken bulbs and for broken lenses. Replace any broken bulbs and any broken lenses.
- Remove any trash buildup around the engine. Remove any trash buildup that is under the floorplate. Also, remove any dirt buildup that is on the top of the crankcase guard.
- Inspect the cooling system for leaks and repair any cooling system leaks. Check the hoses, the radiator fins, the radiator cap, and the drain area.
- Inspect the engine precleaner screen for any dirt buildup and for debris buildup. Remove any dirt and debris.
- Inspect the engine compartment for leaks and repair any engine compartment leaks. Check around all seals and around all covers.
- Inspect the condition of the steps and of the handholds. Inspect the steps and the handholds for cleanliness. If necessary, repair the steps or clean the steps. Inspect the Rollover Protective Structure (ROPS) for damage. Inspect the Falling Object Protective Structure (FOPS) for damage. Consult your Caterpillar dealer for any necessary repairs.

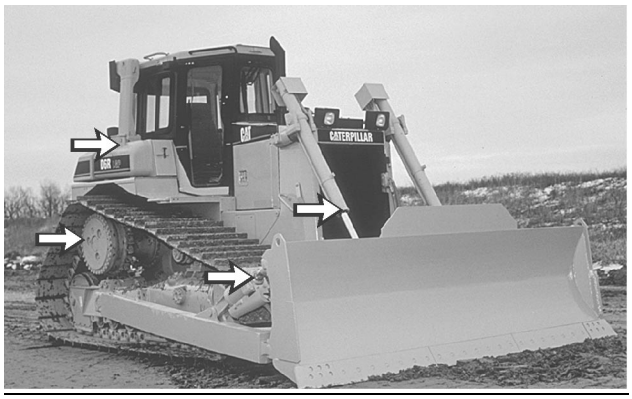


Illustration 245 g00103815

- Inspect the hydraulic system for leaks. Repair any hydraulic system leaks. Inspect the hoses, the seals, and the flanges.
- Inspect the final drive for leaks. Repair any final drive leaks.

Illustration 246 g00103816

- Make sure that the covers and the guards are secured. Inspect the covers and the guards for damage, for loose bolts, and for missing bolts.
- Inspect the transmission for leaks. Repair any transmission leaks. Check around the seals and around the covers. Also, check the hoses around the transmission.

Illustration 247 g00103817

- Inspect the tracks. Repair the tracks if the tracks are damaged or excessively worn. Tighten any loose bolts. Replace missing bolts. Check the tracks for excessive dirt buildup. Check the tightness of the track. Refer to Operation and Maintenance Manual, “Tracks Adjustment - Check”.
- Inspect the guiding guards for the track. Check for loose bolts or for missing bolts. Check the track components for damage and for wear.
- Inspect the operator compartment for cleanliness. Remove any trash buildup and any dirt buildup.
- Inspect the instrument panel. Repair any broken gauges and any broken lights.

Illustration 248 g00103818

- Make sure that the horn, the backup alarm, the lights, the guards, and the shield are working properly.

i01104219

Winch Filter and Magnetic Strainer - Replace/Clean

SMCS Code: 5163-070-FI, MGS; 5163-510-FI, MGS

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

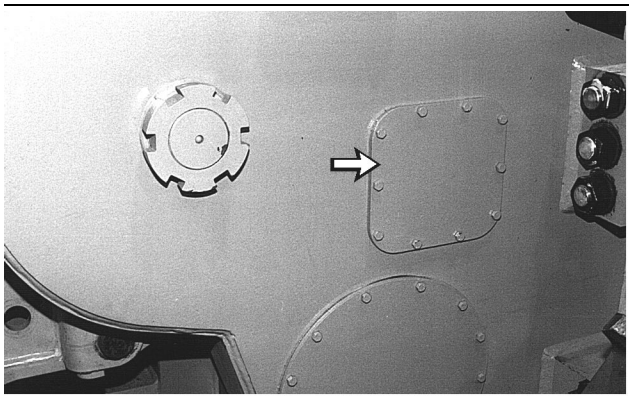


Illustration 249 g00040007

1. Remove the cover and the gasket.

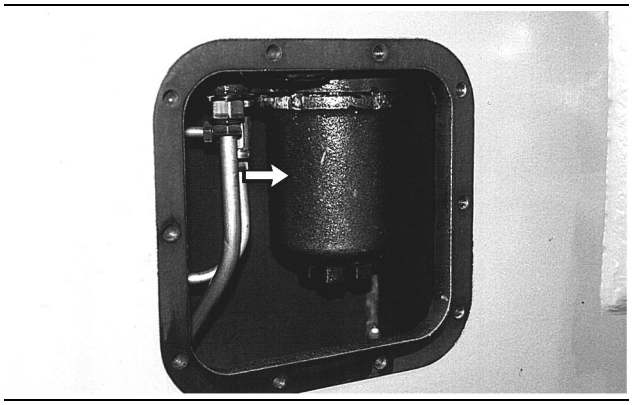


Illustration 250 g00040006

2. Remove the filter element housing with a wrench.
3. Remove the filter element from the filter element housing.
4. Clean the filter element housing with a clean cloth.
5. If the seal is damaged, replace the seal. Lubricate the seals with clean oil.
6. Install a new filter element into the filter element housing.
7. Tighten the filter element housing to a torque of27 ± 4 N·m (20 ± 3 lb ft).
8. Install the cover and the gasket.

Clean the Magnet and Clean the Strainer

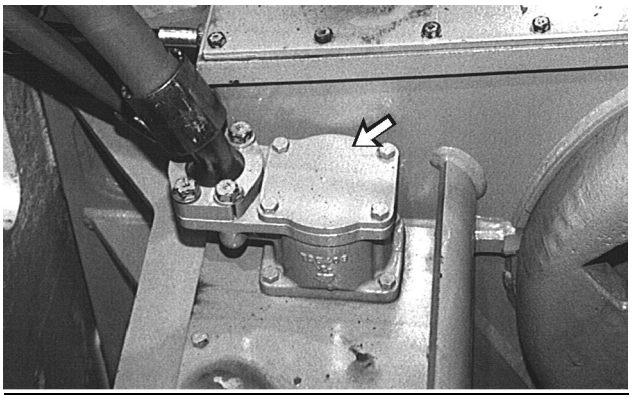


Illustration 251 g00040008

1. Remove the cover, the magnet, and the strainer.
2. Clean these parts in a clean nonflammable solvent.
3. Install the strainer and the magnet.
4. Install the cover.

i00052156

Winch Oil - Change

SMCS Code: 5163-044

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

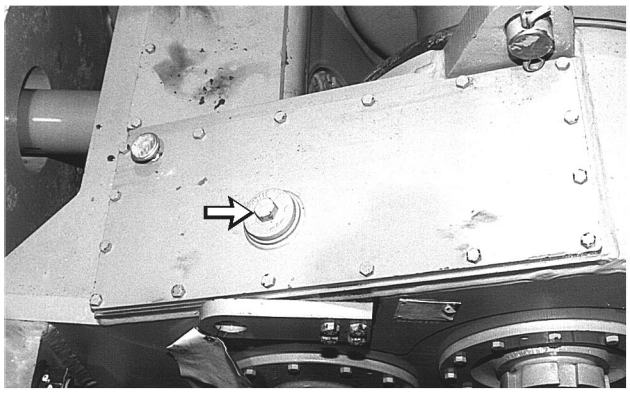


Illustration 252 g00039947

1. Remove the oil filler plug.

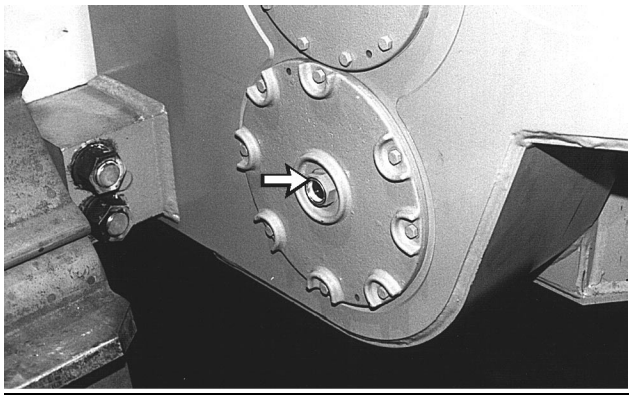


Illustration 253 g00039945

2. Remove the drain plug on the bottom of the winch. Allow the oil to drain into a suitable container.

3. Inspect the plug seal. If necessary, replace the plug seal.

4. Clean the drain plug and install the drain plug.

5. Fill the oil compartment until oil is visible in the sight gauge. See Operation and Maintenance Manual, “Refill Capacities”.

6. Clean the filler plug and install the filler plug.

7. Run the engine at low idle. Maintain the oil level so that the oil level is visible in the sight gauge.

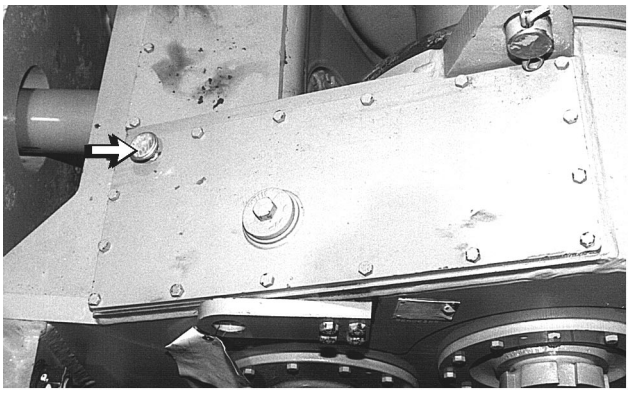


Illustration 254 g00039952

8. Remove the breather on top of the winch case. Wash the breather in a clean nonflammable solvent. Install the breather.

i00038229

Winch Oil Level - Check

SMCS Code: 5163-535-FLV

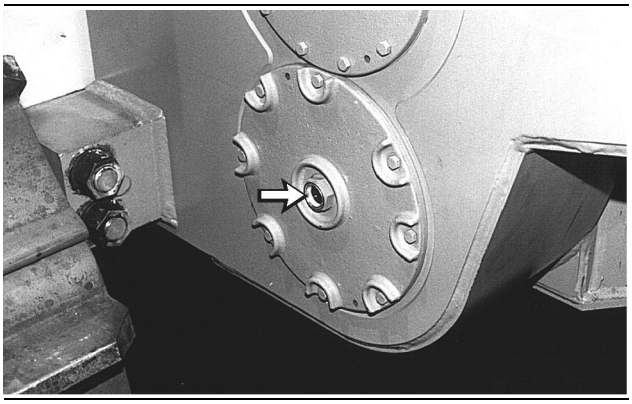


Illustration 255 g00039951

When the engine is at low idle, the oil should be visible in the sight gauge.

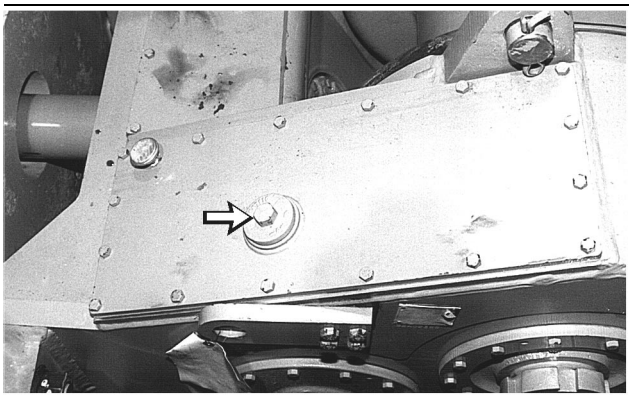


Illustration 256 g00039947

Remove the oil filler plug. If necessary, add oil through the oil filler cap.

Check for oil leaks around the covers and around the hoses. Repair any oil leaks.

i00052230

Winch Wire Rope - Install

SMCS Code: 5163-012

⚠ WARNING

Personal injury or death can result from worn wire rope cable.

Worn or frayed cable could break causing injury.

Check the wire rope cable. If cable is worn or is frayed install a new cable.

The wire rope cable is attached to the drum that is on the winch. The wire rope cable is attached with a standard cable ferrule. The ferrule fits into a socket on the drum. The wire rope cable is secured with a bolt-down clamp.

Ferrules are made in several diameters and in several lengths. Use the following table to specify the correct ferrule when you order a ferrule.

Table 21

DIAMETER OF THE WIRE ROPE CABLE	CABLE FERRULES		
	NUMBER	OUTSIDE DIAMETER	LENGTH
28 mm (1.125 inch)	J 9	60.0 mm (2.375 inch)	69.0 mm (2.750 inch)
32 mm (1.250 inch)	J 8	60.0 mm (2.375 inch)	69.0 mm (2.750 inch)

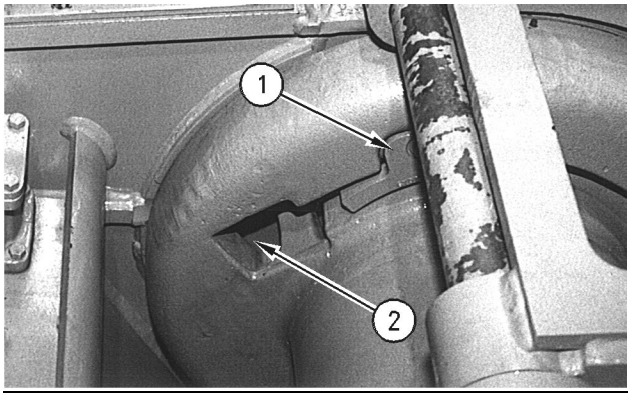


Illustration 257 g00039959

1. Put the wire rope cable in a straight line behind the machine.
2. Remove clamp (1) and install the ferrule end into socket (2).
3. Install clamp (1).
4. Reel in the wire rope cable.

i01279658

Window Washer Reservoir - Fill

SMCS Code: 7306-544

NOTICE
When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

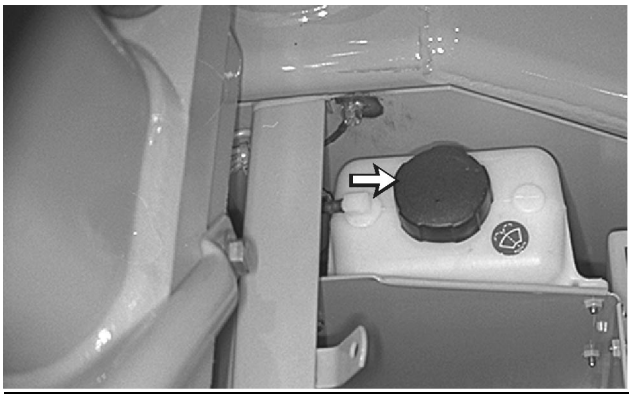


Illustration 258 g00103795

Window Washer – The washer fluid bottle is on the left side of the operator's compartment. Open the access cover. Remove the fluid bottle cap in order to fill the washer fluid bottle.

i01279804

Window Wipers - Inspect/Replace

SMCS Code: 7305-040; 7305-510

Illustration 259 g00103881

Inspect these wiper blades: the front, the right, the left, and the rear. Replace any wiper blades that are damaged or worn. Replace any wiper blades that streak the window.

i01124791

Windows - Clean

SMCS Code: 7310-070; 7340-070

Use commercially available window cleaning solutions to clean the windows.

To clean the outside of the rear window from the inside of the cab, remove the sliding section of the rear window. Use the following procedure in order to remove the sliding section of the rear window.

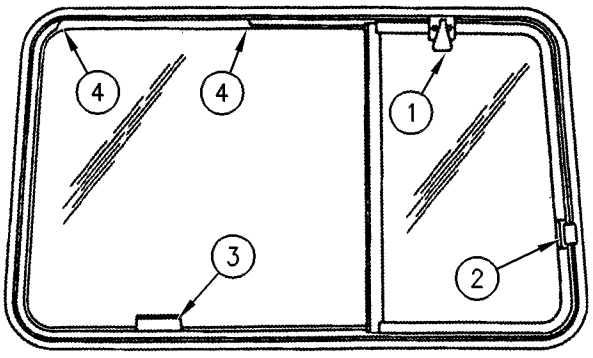


Illustration 260 g00039956

1. Lift latch (1) in order to slide the windows. Squeeze latch (2) in order to move the window from the CLOSED position.
2. Move handle stop (3) to the UP position. To move the handle stop to the UP position, lift the handle and rotate the handle simultaneously. Rotate the handle until the handle is vertical.
3. Move the sliding section of the window to opening (4) in the upper window channel.
4. Tilt the top of the window toward the inside of the cab. Remove the window.
5. Stay inside the cab in order to clean the outside of the rear window.
6. After cleaning, install the sliding section of the rear window.